THE LANCET.

A Journal of British and Foreign Medicine, Surgery, Obstetrics, Physiology, Chemistry, Pharmacology, Public Health, and News.

TELEGRAPHIC ADDRESS—LANCET, WESTRAND LONDON TELEPHONE NUMBER—GERRARD 5356

No. VII. of Vol. I., 1916.
No. 4824. Vol. CXC. LONDON, SATURDAY, FEBRUARY 12, 1916. Price 6d.

"*The best text-book of surgery in English.*"—The Lancet.

NINTH EDITION.

ROSE AND CARLESS' SURGERY.

Pp. xii. + 1408, with 16 Coloured Plates and 609 Figs. Price 21s. net.

"..... *The invaluable rock on which to build the full knowledge of surgery.* ..... *It contains everything the student of to-day requires, and almost all the practitioner of to-day will find of use.* ..... *There is no text-book of surgery in this or any other country so adequate and yet so convenient.* ..... *It is the only book we are taking with us to the 'front.'*"—Practitioner.

London: Baillière, Tindall & Cox, 8, Henrietta-street, Covent Garden.

UNRESERVED PRAISE.

"BEYOND RIVALRY, BEST OF ITS KIND."

This is the opinion in *The British Journal of Surgery*, January, of ROWLANDS and TURNER'S OPERATIONS OF SURGERY. Sixth Edition (Jacobson), 2 vols. £2 10s. net.

This opinion is sustained by BIG SALES.

The work is acclaimed throughout the Empire and the U.S.A.

London: J. & A. Churchill, 7, Great Marlborough-street.

A STANDARD WORK OF REFERENCE FOR THE PRESCRIBER.

Price 10s. 6d. net; post free (inland) 10s. 10d.

SQUIRE'S POCKET COMPANION

to the new BRITISH PHARMACOPŒIA, 1914.

See Page 15.

By SAMUEL WEST, M.D., F.R.C.P.

GRANULAR KIDNEY and PHYSIOLOGICAL ALBUMINURIA.

H. J. Glaisher. 7s. 6d. net.

Third Edition. With 22 Illustrations. Price 3s. 6d. net.

ANÆSTHETICS.

By J. BLUMFELD, M.D.,
Senior Anæsthetist to St. George's Hospital.

"*Dr. Blumfeld's handbook of Anæsthetics leaves little to be desired* ..... *it is packed with useful information and practical hints.*"—British Medical Journal. "*A truly excellent manual.*"—Lancet.

Baillière, Tindall & Cox, 8, Henrietta-street, Covent Garden, London.

Fourth Edition. Revised and Enlarged. Crown 8vo. 9s. 6d. net.

SYNOPSIS OF SURGERY.

For PRACTITIONERS and STUDENTS.

By E. W. HEY GROVES, M.S., M.D., B.Sc.Lond., F.R.C.S.Eng., Surgeon, Bristol General Hospital; Lecturer on Surgery, Bristol University.

With Diagrams of Surface Markings.

"The reader will not only find what he wants with ease, but will also be enabled to follow the subject of his reference with interest and profit. May be regarded as complete in its range of subjects."—Br. Med. Jnl.

Bristol: J. Wright & Sons Ltd. London: Simpkin & Co. Ltd.

By W. SOLTAU FENWICK, M.D.

DYSPEPSIA.

Octavo, 485 pages. Illustrated. Cloth. 13s. net.

W. B. Saunders Company, 9, Henrietta-street, W.C.

By Sir LAUDER BRUNTON, Bart., M.D., F.R.C.P., F.R.S., &c.
Second Edition. Almost Entirely Rewritten.

THERAPEUTICS OF THE CIRCULATION.

Small Foolscap 8vo. With 111 Illustrations. Price 5s. net.

"There can be few British medical men who are unacquainted with the author's lucid style and practical method of exposition. In this book they will find a sound and up-to-date account of the subject dealt with, and full descriptions of the various therapeutic measures employed in the relief of the symptoms of cardio-vascular disease. It may be cordially recommended to students and practitioners of medicine."—The Lancet.

"The subject is dealt with by a master hand."—The Prescriber.

John Murray, Albemarle-street, London.

ON DISEASES of the LUNGS and PLEURÆ,

including TUBERCULOSIS and MEDIASTINAL GROWTHS.

By Sir RICHARD DOUGLAS POWELL, Bart., K.C.V.O., M.D.Lond., F.R.C.P., and P. HORTON-SMITH HARTLEY, C.V.O., M.D.Camb., F.R.C.P. Fifth Edition.

With 29 Plates (six coloured) from Original Drawings, and 53 Illustrations in the text. Demy 8vo. 21s. net; inland postage 7d., abroad, 1s. 4d.

"We can safely say that no affection of the lungs has escaped the notice of the writers."—The Lancet.

London: H. K. Lewis & Co. Ltd., 136 Gower Street, W.C.

JUST PUBLISHED.

WADSWORTH'S POSTMORTEM

AN IMPORTANT WORK.

See Saunders' Advertisement on Page 3.

By H. BELLAMY GARDNER, M.R.C.S., L.R.C.P. Lond.

A MANUAL OF SURGICAL ANÆSTHESIA.

Second Edition. Price 7s 6d. 215 pages, 46 Illus., 8 Plates.

London: Baillière, Tindall & Cox, 8, Henrietta-street, Covent Garden.

Just Published. Crown 8vo. Cloth. Pp. 182. 14 Illustrations. Price 2s. 6d. net. Postage 4d.

BACK INJURIES, and their SIGNIFICANCE under the WORKMEN'S COMPENSATION and OTHER ACTS.

By ARCHIBALD McKENDRICK, F.R.C.S.E., &c., Surgeon-in-Charge of Surgical X-Ray Department, Royal Infirmary, Edinburgh.

E. & S. Livingstone, 15-17, Teviot-place, Edinburgh.

Now Ready. Large Royal Octavo. Pp. xii. + 261. With 3 Coloured Maps, 5 Coloured Plates, and 68 other Illustrations. Price 7s. 6d. net.

SLEEPING SICKNESS:

BEING A RECORD OF FOUR YEARS' WAR AGAINST IT IN PRINCIPE, PORTUGUESE WEST AFRICA.

By B. F. Bruto da Costa, J. Firmino Sant'Anna, A. Correia dos Santos, and M. G de Araujo Alvares

Translated by Lieut.-Col. J. A. Wyllie, F.R.G.S.

Published for The Centro Colonial, Lisbon, by Baillière, Tindall & Cox, 8 Henrietta street, Covent Garden, London.

J. W. THOMSON WALKER, M.B., C.M.Edin., F.R.C.S.Eng.

SURGICAL DISEASES AND INJURIES OF THE GENITO-URINARY ORGANS.

880 pages, 24 Colour and 21 Black-and-White Plates and 279 Illustrations in the Text. Price 25s. net.

"Will hold its place for many years as the best English text-book of the subject."—British Journal of Surgery.

Cassell & Co., La Belle Sauvage, London, E.C.

By H. J. WARING, M.S., M.B., B.Sc.Lond., F.R.C.S., Surgeon to, and Joint Lecturer in Surgery at, St. Bartholomew's Hospital; Consulting Surgeon to the Metropolitan Hospital; Member of Court of Examiners, Royal College of Surgeons; late Examiner in Surgery, University of London.

New Edition Shortly. 8vo, extra cloth. Pp. xvi.-385, with 58 Engravings. Price 12s. 6d. net.

SURGICAL DISEASES OF THE GALL-BLADDER, BILE DUCTS, AND LIVER.

Their Pathology, Diagnosis, and Treatment.

(*Including Jacksonian Prize Essay.*)

Henry Frowde & Hodder & Stoughton, 20, Warwick-square, E.C.

By LESLIE THORNE THORNE, M.D., B.S.

NAUHEIM TREATMENT of DISEASES of the HEART and CIRCULATION in ENGLAND.

Fourth Edition. Enlarged. Price 3s. 6d. net.

Pp. viii.+104. With 28 Photographs of the Schott Exercises and 27 other Illustrations.

"It is the best and most practical work on the subject."
—West London Medical Journal.

London: Baillière, Tindall & Cox, 8, Henrietta-street, Covent Garden.

LIBRARY OF CONGRESS FEB 24 1916

1/- PER TABLET

3% BINIODIDE MERCURIAL SOAP

THIS IS WITHOUT DOUBT THE MOST POWERFUL GERMICIDAL SOAP MADE.

Surgeons and Gynæcologists who carry this soap find that they need not carry Mercuric Unguents.

EACH TABLET BEARS A 3d. GOVERNMENT STAMP.

EDWARD COOK & Co., Ltd., Bow, LONDON, E.

Valentine's Meat-Juice

In **Hospital** and **Private Practice** during **Epidemics** and **in their own persons** when ill, **Physicians** have demonstrated the **Value** of **Valentine's Meat-Juice** in **Sustaining** and **Strengthening** the weakened **Vital Forces.**

Pneumonia *and* Influenza.

Cavalier Dr. Enrico Ballerini, *Late Surgeon to the Hospital of Rome, Italy:* "I have used VALENTINE'S MEAT-JUICE in the treatment of patients and also personally after having been ill with Influenza, and I must say it is an excellent tonic in conditions of great organic weakness. I have prescribed it with the greatest satisfaction for convalescents and invalids restricted to a liquid diet."

Edward C. Seufert, M. D., *Professor Histology and Pathology, Illinois Medical College, Chicago:* "I have always been a user of the valuable preparation, VALENTINE'S MEAT-JUICE. The best results that I have obtained from it have been in Typhoid Fever and Broncho-Pneumonia of children. I believe that the samples sent helped to save the child of one of my students at the College."

For Sale by European and American Chemists and Druggists.

VALENTINE'S MEAT-JUICE COMPANY,

D 175 **RICHMOND, VIRGINIA. U. S. A.**

THE LANCET.

No. 4[illegible]. LONDON, SATURDAY, FEBRUARY 12, 1916. Vol. CXC.

CONTENTS.

The whole of the literary matter in THE LANCET is copyright.

THE LETTSOMIAN LECTURES on The Effects of Explosives upon the Central Nervous System. Delivered before the Medical Society of London, by D. W. MOTT, M.D.Lond., F.C.P.Lond., Hon. LL.D. Edin., F.R.S., Major, Royal Army Medical Corps (T.), Hon. London General Hospital; Pathologist to the London County Council Asylums.—Lecture I.—(*Illustrated*)..... 331

INVESTIGATIONS on Clinical Thermometry: Continuous and Quasi-continuous Temperature Records in Man and Animals in Health and Disease. By G. SIMS WOODHEAD, M.A., M.D., LL.D., Professor of Pathology, Cambridge; and P. C. VARRIER-JONES, M.A., M.R.C.S., L.R.C.P. Lond., Foundation Scholar, St. John's College, Cambridge. (From the Pathological Department, University of Cambridge.) Part III. The Electrical Resistance Thermometer.—(*Illustrated*).—(*To be continued*).... 338

ORIGINAL ARTICLES.

The Aerial Conveyance of Infection, with a Note on the Contact Infection of Chickenpox. By FREDERIC H. THOMSON, M.B., C.M.Aberd., D.P.H., Medical Superintendent of the North-Eastern Hospital, Tottenham, N. 341

The Urea Content of the Cerebro-spinal Fluid: With Special Reference to the Diagnosis of Uræmia. By R. G. CANTI, M.A., M.B. Cantab., Demonstrator of Pathology, St. Bartholomew's Hospital; Pathologist to the Alexandra Hospital, Queen-square 344

Prophylactic Vaccination Against Hay Fever. By B. P. SORMANI, Lecturer on Serology at the University of Amsterdam. (From the Laboratory of the Onze-Lieve-Vrouwe-Gasthuis.) 348

CLINICAL NOTES:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A Case of Febris Colombensis. By G. A. LURIE, M.D. Chicago, Attached to the American Red Cross Sanitary Commission in Serbia..... 350

Case of Intracranial Hæmorrhage without Symptoms of Compression. By P. W. LAM, M.B., Ch.B Edin.; and ED. LAW, M.B., Ch.B. Edin., Resident Surgeons, District Hospital, West Bromwich 350

MEDICAL SOCIETIES.

ROYAL SOCIETY OF MEDICINE:

SECTION OF SURGERY:—The Use of Condensers in the Diagnosis, Prognosis, and Treatment of Nerve Lesions 351

SECTION OF OPHTHALMOLOGY: Exhibition of Cases.—Cause of the Ophthalmoscopic Appearances in Amaurotic Family Idiocy.—Superficial Linear Keratitis.—Cataract in Experimental Thyroidectomy 351

WEST LONDON MEDICO-CHIRURGICAL SOCIETY: Exhibition of Specimens and Skiagrams 352

FULHAM MILITARY HOSPITAL: Septic Compound Fractures due to Gunshot Wounds 353

BRADFORD MEDICO-CHIRURGICAL SOCIETY: Exhibition of Specimens.—Tuberculosis Arrangements from the Clinical Point of View 353

REVIEWS AND NOTICES OF BOOKS.

Post-mortem Methods. (Cambridge Public Health Series.) By J. Martin Beattie, M.A., M.D.Edin. 354

National Insurance Acts; Handbook for the Use of Approved Societies. English edition ... 354

War and Civilisation: an Open Letter to a Swedish Professor. By J. M. Robertson, M.P. 355

Quarterly Journal of Experimental Physiology. Edited by E. A. Schäfer, W. D. Halliburton, C. S. Sherrington, E. H. Starling, and A. D. Waller. Vol. IX..... 355

LEADING ARTICLES.

PHYSICAL TREATMENT FOR DISABLED SOLDIERS 361

DENTISTS AND MILITARY SERVICE 362

ANNOTATIONS.

Inoculation of Civilians Against the Enteric Group 362

The Administration of the Pharmacy Acts..... 363

The Treatment of Pellagra with Sodic Citrate 363

The Regulation of Prostitution in Sweden 364

Occupational Injuries due to Radium 364

Juvenile Crime..... 365

A Leech in the Nasal Cavity.... 365

The Sale of Laudanum..... 365

Deaths of American Medical Men in 1915 365

SPECIAL ARTICLES.

Clinical Report on the Applications of Eusol. Report to the Medical Research Committee: 1. Recent Accidental Wounds.—2. Wounds already Septic.—3. Serous and Synovial Cavities.—4. Mucous Surfaces.—5. Inflammatory Lesions.—6. Skin Infection.—7. Rectal Operation.—General Conclusion.—Appendix.—(*Concluded*) 356

Scotland: The Midwives (Scotland) Act, 1915; The Central Midwives Board for Scotland.—Edinburgh University Court.—Edinburgh Insurance Committee. The Royal Public Dispensary, Edinburgh.—Medical Service for Highlands and Islands..... 366

Ireland: The Gratitude of a Board of Guardians.—A Medical Mayor.—The Forster Green Hospital, Belfast.—The Belfast Hospital for Sick Children.—Windfall for Bangor, Co. Down 367

An Outbreak of Diarrhœa Associated with Pollution of the Public Water-supply.—The Nature of the Outbreak..... 368

Asylum Reports 369

The Services: Royal Navy Medical Service.—Army Medical Service.—Royal Army Medical Corps.—Indian Medical Service.—Special Reserve of Officers.—Territorial Force.—Deaths in the Services.—Journal of the Royal Army Medical Corps.—The Russian Order of St. Anne 370

The Belgian Doctors' and Pharmacists' Relief Fund.—The Week's Subscriptions 378

VITAL STATISTICS:

Health of English Towns..... 371

Health of Scotch Towns 371

Health of Irish Towns..... 371

CORRESPONDENCE.

Albuminuric Retinitis in Epidemic (Acute) Nephritis (Dr. Samuel West)..... 372

Inversion of the Pelvic Bones (Dr. D. Berry Hart)..... 373

Functional Nervous Diseases (Captain Donald E. Core, R.A.M.C. (T.F.))..... 373

The Income-tax and Gratuities to Temporary Lieutenants, R.A.M.C. (Dr. A. G. Bateman) 374

Ammonia as an Enema (Dr. T. A Black)..... 374

Matriculation at the University of Manchester (Professor G. Elliot Smith)..... 374

The Treatment of Whooping-cough (Mr. W. J. Midelton)... 374

THE WAR.

The Casualty List..... 379

Deaths among the Sons of Medical Men 379

The Employment of Women in Military Hospitals 379

Distinctive Uniforms for Medical Officers 379

Training of Blinded Soldiers 380

A British Hospital for Corfu ... 380

The American Women's War Hospital at Paignton 380

Red Cross Sale 380

Red Cross Hospital for Somerset 380

OBITUARY OF THE WAR:

Henry Bridge Yates, B.A. Cantab., M.D., C.M. McGill, Lieutenant Colonel, C.A.M.C.—(*With Portrait*) 380

Alfred Noel Garrod, B.A. Cantab., M.R.C.S. Eng., L.R.C.P.Lond., Lieutenant, R.A.M.C.—(*With Portrait*) 381

OBITUARY.

Charles Stonham, F.R.C.S. Eng., C.M.G., Colonel, A.M.S.; Senior Surgeon to Westminster Hospital 375

James Stanley Newton Boyd, M.B., B.S. Lond., F.R.C.S. Eng., Lieutenant-Colonel, R.A.M.C. (T.F.); Senior Surgeon to Charing Cross Hospital, &c.—(*With Portrait*).... 376

Francis Gethin Hopkins, M.D., B.Ch. Dub., Lieutenant, R.A.M.C.; late Principal Medical Officer, Gold Coast Colony 378

Edgar Howard Lake 378

MEDICAL NEWS.

Royal United Hospital, Bath ... 340

West Cornwall Infirmary, Penzance 351

Pensions for Nurses..... 351

The Anglo-Russian Hospital 353

University of Sheffield..... 371

The South African Hospital..... 374

Examining Board in England by the Royal Colleges of Physicians of London and Surgeons of England: Pass-list... 381

The Royal Faculty of Physicians and Surgeons of Glasgow 382

Royal Microscopical Society 382

Royal Medical Benevolent Fund 382

Appointments 382

Vacancies 383

Births, Marriages, and Deaths.. 383

Notes, Short Comments, and Answers to Correspondents... 383

Medical Diary 384

Meteorological Readings..... 385

Acknowledgment of Communications received 386

FOR INDEX TO ADVERTISEMENTS SEE PAGES 2 & 4.

INDEX

MEDICAL AND OTHER BOOKS AND PUBLICATIONS

PAGE

BAILLIERE, TINDALL & COX:—
Biggs ..... Indigestion 6
" ..... War Diseases (Typhus, Enteric, Dysentery, and Cholera) 6
Blumfeld .. Anæsthetics .. Cover i
Da Costa, &c. ..... Sleeping Sickness Cover i
Gardner .. Manual of Surgical Anæsthesia.. Cover i
Rose & Carless' Surgery .. Cover i
Thorne .... Nauheim Treatment of Diseases of the Heart and Circulation in England Cover i

BALE, SONS & DANIELSSON:—
De Quervain Clinical Surgical Diagnosis for Students and Practitioners .. 7
Learmann.. Emergencies in Medical Practice 7
Local Anæsthesia; an Illustrated Text-Book for Students and Practitioners 7
Lohmann .. Disturbances of the Visual Functions .. 7
Simpson .. The Principles of Hygiene 7
" .. The Maintenance of Health in the Tropics 7
Surgery of the Lung 7
Thompson's Compendium of the Pharmacopœias and Formularies (Official and Unofficial) .. 7

PAGE

BALE, SONS & CO.—(Continued).
Vallow .... Care and After-Care of Consumptives: The Inevitable Complement 7

CASSELL & CO.:—
Walker .... Surgical Diseases and Injuries of Genito-Urinary Organs Cover i

CHURCHILL, J. & A.:—
Rowlands & Turner's Operations of Surgery ..... Cover i
Squire's Pocket Companion to the British Pharmacopœia, 1914 15
Thorne, Beaty .... Schott Methods of the Treatment of Chronic Diseases of the Heart 7

FROWDE AND HODDER & STOUGHTON:—
Waring .... Surgical Diseases of the Gall Bladder, Bile Ducts, & Liver Cover i

GLAISHER:—
West ..... Granular Kidney and Physiological Albuminuria .... Cover i

KIMPTON:—
Brophy .... Oral Surgery. A Treatise on the Surgical Diseases, &c., of the Mouth and Associated Parts 5

PAGE

KIMPTON—(Continued).
Cumberbatch .... Morton's Essentials of Medical Electricity 5
Preston .... Fractures and Dislocations: Diagnosis and Treatment 5

LEWIS & CO:—
Powell, Sir R. D., & Hartley On Diseases of the Lungs and Pleuræ, including Tuberculosis & Mediastinal Growths .... Cover i

LIVINGSTONE (EDIN.):—
M'Kendrick Bark Injuries and their Significance under the Workmen's Compensation and other Acts Cover i

MEDICAL PUBLISHING CO.:—
Lane, Sir A. .... Operative Treatment of Fractures 6

MURRAY:—
Brunton, Sir L. .... Therapeutics of the Circulation .. Cover i

PULMAN & SONS:—
Elliot ..... Sclero-Corneal Trephining in the Operative Treatment of Glaucoma 6

PAGE

SAUNDERS COMPANY:—
Albee ..... Bone-Graft Surgery .. 3
Fenwick .. Dyspepsia .... Cover i
Herrick .... Introduction to Neurology 3
Pilcher .... Cystoscopy 3
Vecki ..... Sexual Impotence 3
Wadsworth. Postmortems 3
Wadsworth's Postmortems Cover i

SMITH, ELDER & CO.:—
Cable ..... Between the Lines .. 5
Leftwich .. An Index of Symptoms. With Diagnostic Methods 5
Wilson .... The Early Diagnosis of Heart Failure and other Essays on the Heart and Circulation 5

WRIGHT & SONS (BRISTOL):—
Groves .... Synopsis of Surgery For Practitioners and Students Cover i

MEDICAL LIBRARIES, &c.:—
Baker, Birmingham—Books .....
Behnke—Stammering, Lisping, and Cleft-Palate Speech i
British Commercial Gas Association—"Towards an Ideal" 35
Ketley—Stammering 6
Lewis & Co.'s Medical & Scientific Circulating Library 9
Matthews—Wood: Application of Trusses to Hernia 7
Squire's Pocket Companion to the new British Pharmacopœia, 1914 ..... Cover i

OFFICIAL AND GENERAL ANNOUNCEMENTS

APPOINTMENTS VACANT:—
Bristol Royal Infirmary 48
City of Manchester — Baguley Sanatorium 49
County Asylum, Whittingham, Preston 49
Coventry and Warwickshire Hospital 49
Elder Dempster & Co., Liverpool.. 49
Evelina Hospital for Sick Children 49
21st Highland Mounted Brigade Field Ambulance 49
Huddersfield Royal Infirmary 48
Leeds Public Dispensary 48
London Lock Hospital 49
Manchester Children's Hospital, Pendlebury 48
Margaret-street Hospital for Consumption 49
New Hospital for Women, Euston-road 49
Royal Albert Hospital, Devonport 48
Royal Free Hospital, Gray's Inn-road 49
Royal Infirmary, Sunderland 48
St. Peter's Hospital for Stone, &c. 48
Salford Royal Hospital..... 49
West Bromwich and District Hospital 48
West Ham and Eastern General Hospital 49
West Ham Union Infirmary 49

ASSISTANCIES, MEDICAL:—
Arnold & Sons, Giltspur-street .. 49
No. 731, L.O., Strand 49
No. 744, L.O., Strand 49
No. 747, L.O., Strand 49
No. 751, L.O., Strand 50
No. 752, L.O., Strand 50
Turner, Adam-street 50

ASYLUMS, HOMES, &c.:—
Abbotswood House, Cinderford .. 47
Ashwood House, Kingswinford .. 43
Barnwood House Hospital 44
Bishopstone House, Bedford 45
Brunton House, Lancaster 48
Buntingford House Retreat, Buntingford 47
Camberwell House, Peckham-road 45

ASYLUMS—(Continued).
Cavendish Nursing Association, Wimpole-street 48
Cheadle Royal..... 44
Clarence Lodge, Clapham Park .. 45
Colthurst House School, Alderley Edge 45
Coppice, The, Nottingham 44
Dalrymple House, Rickmansworth 47
Dartmoor Sanatorium 45
David Lewis Colony, Alderley Edge 43
De Gonville House, St. Leonards-on-Sea 48
Duff House, Banff..... 48
Edgar Allen Institute, Sheffield 45
Faraday House, Clapham Common..... 45
Ghyllwoods 47
Grove House, Church Stretton 44
Grove, The, Catton, Norwich..... 44
Haslemere Nursing Home 48
Haydock Lodge, Newton-le-Willows 45
Heigham Hall, Norwich 44
Home for Epileptics, Maghull 43
Invernith Sanatorium, Colinsburgh 47
Littleton Hall, Brentwood..... 48
London Fever Hospital..... 44
Lynton House, Broadstairs 44
Malling Place, Kent 44
Melbourne House, Leicester 47
Mendip Hills Sanatorium 48
Meyrick, Brighton 48
Moat House, Tamworth 44
Mundesley Sanatorium, Norfolk .. 47
Newmains Retreat, Lanarkshire.. 46
Nordrach-on-Dee, Banchory 46
Northumberland House, Finsbury Park 45
Northwoods House, Winterbourne 45
No. 361, L.O., Strand 49
No. 412, L.O., Strand 49
Peckham House..... 45
Pendyffryn Hall Sanatorium, Nordrach-in-Wales 46
Plympton House, Plympton 44
Portsmouth Corporation Mental Hospital 45
Ravenscroft House, Golder's Green 48
St. Andrew's Hospital, Dollis Hill 48
St. Andrew's Hospital, Northampton 44
St. Luke's Hospital for Mental Diseases 45
Shaftesbury House, Formby-by-the-Sea 45

ASYLUMS—(Continued).
Springfield House Private Asylum, Bedford 43
Stretton House, Church Stretton.. 44
The General Manager, Cravenstreet 48
The Grange, near Rotherham 44
Vale of Clwyd Sanatorium 45
Warneford Asylum, Oxford..... 45
Wye House, Buxton..... 44

HEALTH RESORTS, BATHS, &c.:—
Peebles Hotel Hydro..... 47
Smedley's, Matlock 47

HOMES WANTED:—
Cavendish Nursing Association, Wimpole street 48

HOUSE & ESTATE AGENTS:—
Dawson & Harden, St. Leonards-on-Sea 50
No. 717, L.O., Strand 50
CONSULTING-ROOMS:—
No. 749, L.O., Strand 50

LIFE & FIRE ASSURANCES, &c.:—
Prudential 40

MEDICAL ACCOUNTANTS, &c.:—
Turner 50

MEDICAL AGENTS:—
Fieldhall, Limited..... 51
Manchester Clerical, &c., Association 50
Medical Agency 51
Moore & Co. 49
Needes, Herbert..... 51
Needes, J. C. 51
Peacock & Hadley..... 51
Turner 51

MEDICAL SCHOOLS:—
(LONDON.)
London School of Clinical Medicine 40
West London Post-Graduate College 40

NURSING INSTITUTES:—
Co-operation of Temperance Male and Female Nurses 42
General Nursing Association..... 41

NURSING INST.—(Continued).
Hospital for Sick Children, Great Ormond-street 41
London Nurses' Association 41
London Temperance Nurses Co-operation 41
Male Nurses Temperance Co-operation..... 41
Mental Nurses Association 41
Mental Nurses' Co-operation..... 41
New Mental Nurses' Co-operation 41
Nurses' Association, York-street.. 42
Nurses' Co-operation, Portland-place 42
St. Bartholomew's Hosp. Trained Nurses' Institution 41
St. John's House 41
St. Luke's Hospital, E.C..... 41
Temperance Association of Male Nurses, Ltd..... 42
Temperance Male Nurses Co-operation 42
The Retreat, York 41

OFFICIAL NOTICES:—
City of London Lying-in Hospital 40
Epsom College 40
London School of Tropical Medicine 40
Queen Charlotte's Lying-in Hospital 40
University of Durham 40
York-road General Lying-in Hospital, Lambeth 40

PARTNERSHIPS & PRACTICES:—
Arnold & Sons, Giltspur-street.... 50
Blundell & Rigby, Strand..... 50
Lee & Martin, Birmingham 50
No. 743, L.O., Strand 50
No. 745, L.O., Strand 50
No. 748, L.O., Strand 50
No. 750, L.O., Strand 50
Turner, Adam street 50

RAILWAY & STEAMSHIP CO.'S.:—
New Zealand Shipping Co..... 41

SCHOOLS, PREPARATORY, &c.:—
Paton, Cannon street..... 40

TUTORS & LECTURERS:—
Behnke 40
Schnelle—Stammering 6
Weymouth 40

For Index to Trade and Miscellaneous Advertisements see page 4.

The Lettsomian Lectures

ON

THE EFFECTS OF HIGH EXPLOSIVES UPON THE CENTRAL NERVOUS SYSTEM.

Delivered before the Medical Society of London

BY FRED. W. MOTT, M.D. LOND., F.R.C.P. LOND., HON. LL.D. EDIN., F.R.S.,

MAJOR R.A.M.C. (T.), 4TH LONDON GENERAL HOSPITAL; PATHOLOGIST TO THE LONDON COUNTY COUNCIL ASYLUMS.

LECTURE I.

(Delivered on Feb. 7th.)

MR. PRESIDENT AND GENTLEMEN,—Permit me to thank you for the great honour the Medical Society of London has done me in asking me to give the Lettsomian lectures this year. The society has been fortunate in having had addresses and discussions on most of the medical and surgical problems concerning the war, with the exception of the effects of high explosives upon the central nervous system in the production of functional neuroses and psychoses. As I have had the opportunity of studying these effects I ventured to change the subject which I at first contemplated.

The employment of high explosives combined with trench warfare has produced a new epoch in military medical science. This war was recently described at a Labour Congress as a barbarous, unromantic, machine war. Yet in no war of the past has individual courage and self-sacrifice shone with greater lustre; for the contemptible little army in the retreat from Mons fought against overwhelming odds and covered itself with glory. Again, in the terribly anxious times when the enemy tried to break through to Calais, what could have surpassed the courage and self-sacrifice of our men in the trenches on the Yser, or the gallant stand of the Canadians when the Germans sprang the gas upon us? Lastly, the landing of the Anzacs is one of the finest and most romantic deeds in the history of war.

High explosives contained in huge shells have played a prominent part in this war, and apart from the effects produced by direct material injury to the central nervous system, there is the moral effect of the continued anxious tension of what may happen, which, combined with the terror caused by the horrible sights of death and destruction around, tends to exhaust and eventually even shatter the strongest nervous system. To live in trenches or underground for days or weeks, exposed continually to wet, cold, and often, owing to the shelling of the communication trenches, to hunger, combined with fearful tension and apprehension, may so lower the vital resistance of the strongest nervous system that a shell bursting near, and without causing any visible injury, is sufficient to lead to a sudden loss of consciousness. So that in considering the effects of high explosives it is absolutely necessary to take into account the state of the nervous system of the individual at the time of the "shock" caused by the explosive. A neuro-potentially sound soldier in this trench warfare may from the stress of prolonged active service acquire a neurasthenic condition, and it stands to reason that a soldier who has become neurasthenic from a head injury or from the acquirement of a disease prior to his enlistment will not stand the strain as well as a neuro-potentially sound man. Again, if in a soldier there is an inborn timorous or neurotic disposition or an inborn germinal or acquired neuropathic or psychopathic taint causing a *locus minoris resistentiæ* in the central nervous system, it necessarily follows that he will be less able to withstand the terrifying effects of shell fire and the stress of trench warfare. Thus, whether a tendency to a neurasthenic condition has been acquired or is more or less inborn, an emotional experience such as fright is more liable to develop the symptoms of a functional neurosis or psychosis.

THE EFFECTS OF HIGH EXPLOSIVES UPON THE CENTRAL NERVOUS SYSTEM.

The effects of high explosives upon the central nervous system fall into three groups. 1. Immediately fatal either from pieces of shell, stones, rocks, or portions of buildings striking the individual, causing instant death, or the person may be buried from the explosion of a mine. Again, instant death must have occurred in groups of men from the effects of shell fire and yet no visible injury has been found to account for it. This matter I shall discuss more fully later.

2. In Group 2 we can place those cases in which the detonation of high explosives has caused wounds and injuries of the body, including the central nervous system, which have not been immediately fatal. The number of these cases which do not exhibit any of the functional disorders and disturbances characteristic of what is termed "shell shock" without visible injury, although such individuals have received most serious and fatal wounds from exploding shells, leads one to consider that in a large proportion of cases of shell shock without visible injury there are other factors at work in the production of the nervous symptoms besides the actual aerial forces generated by the explosive.

3. The third group includes injuries of the central nervous system without visible injury, and to this group I shall give especial attention, as it is the one of which I have had most experience. I include the functional neuroses and psychoses because although there may be no discoverable lesion in a "psychic trauma," yet so complex is the structure of the human central nervous system, and so subtile the chemical and physical changes underlying its functions, that because our gross methods of investigating dead material do not enable us to say that the living matter is altered, yet admitting that every effect owns a cause, a refractory phase in systems or communities of functionally correlated neurons must imply a physical or chemical change and a break in the links of the chain of neurons which subserve a particular function. As we know, one of the peculiarities of the functional neuroses is not only the sudden manner in which an emotional shock may engender a loss of function, but likewise the sudden manner in which it may be unexpectedly restored by a sudden stimulus of the most varied kind, provided there is an element of surprise. That is, attention is for a moment taken off its guard. I am referring especially to mutism. The causes of shock to the nervous system by high explosives may be considered under the headings of physical trauma—concussion or "commotio cerebri" by direct aerial compression or by the force of the aerial compression blowing the person into the air or against the side of the trench or dug-out; or by blowing down the parapet or roof on to him causing concussion, or a sandbag hitting him on the head or spine might easily cause concussion without producing any visible injury.

Again, he might be buried and partly asphyxiated or suffer from deoxygenation of his blood by CO poisoning, for, as I shall prove later, these high explosives generate considerable quantities of CO which is inodorous and would not be recognised. A man lying unconscious or even conscious and partially buried and unable to move would be very liable to be poisoned by CO and not know anything about it; nor would the rescuers, as the poisonous effects of the gas depend upon the amount in the atmosphere and the length of time to which the individual is exposed to it.

A Brief Survey of the Dynamic Conditions of the Central Nervous System, especially in Relation to the Cerebro-spinal Fluid and Shock.

The whole central nervous system is contained in a closed space, the walls of which are formed by the cranium and spinal column, inside of which is the stout dura mater. Within this closed space is the cerebro-spinal fluid, which fills up all the space not occupied by blood-vessels or tissues. The cerebro-spinal fluid thus serves to equalise the pressure throughout the whole cranio-spinal cavity; moreover, at the base of the brain where the vital centres of the medulla are situated it acts as a water cushion, protecting them from the shock of commotion and concussion. The cerebro-spinal fluid also serves as a self-adjusting mechanism by maintaining a uniform equalisation of the blood-supply to the nerve elements during the rhythmical variations of respiration and circulation. Now this fluid is incompressible, and under ordinary conditions of pressure from without it serves as a perfect protective mechanism, but when large quantities of these high explosives are detonated an enormous aerial compression is instantly generated, and it is quite possible that this may be transmitted to the fluid about the base of the brain and cause shock to the vital centres of the floor of the fourth ventricle, causing instantaneous arrest of the functions of the cardiac and respiratory centres. Lord Sydenham, one of the highest authorities on the dynamics of explosives, concludes that the forces generated are sufficient to cause instantaneous death, and he has informed me that in the American Medico-Military Report it is stated that "an aneroid showed that the explosion of one of these shells caused a sudden atmospheric depression of about 350 mm. of the mercury tube, corresponding to a dynamic pressure of about 10 tons to the square yard." One effect of this is to liberate nitrogen suspended in the blood and transform it into bubbles of gas which are driven into the capillary vessels and cause instant death. The writer, Surgeon Fauntleroy, is not satisfied with the explanation which "does not take into account the primary air compression by which men are sometimes hurled into the air." He (says Lord Sydenham) considers, as I do, that the blow on the body, especially over the heart and abdomen, may cause instant death. I have had officers under my care who have been blown in the air considerable distances. One Royal Army Medical Corps officer told me he was blown 30 feet; another told me that he was blown a considerable distance in a communication trench and lost consciousness for some time; another told me that the effect was like a violent push of irresistible force with a down cushion. But I shall have occasion later to refer to this explanation of sudden death when considering the various theories regarding the cause of death of groups of men found in postures and attitudes of the last act of life. If aerial concussion by the forces generated by high explosives can cause death without visible injury, I think more probably it would arise from sudden arrest of the medullary centres. The stem of the brain surrounded by the cerebro-spinal fluid is prevented from oscillating by the nerves which issue from it to pass through the holes in the skull; likewise the spinal cord by the anterior and posterior roots and the ligamentum dentatum is prevented from oscillating. A sudden shock of great intensity would be transmitted through this incompressible fluid, and seeing that it not merely surrounds the central nervous system but fills up the ventricles and central canal and all the interstices of the tissues serving as it does the function of lymph, it follows that a shock communicated to the fluid of sufficient intensity would make itself felt on all the neurons.

The Neuron Doctrine in Relation to "Shock" and the Theory of Diaschisis.

The central nervous system consists of innumerable anatomically distinct nervous units. Each consists of a cell with branching processes; there is one process the axon, the remaining processes are termed dendrons. The axon and dendrons are conductile; the chemical changes incidental to nervous action almost entirely occur in the cell. There are two types of neurons, the first type of Golgi, in which the axon leaves the grey matter to become surrounded by a myelin sheath to enter into the formation of the white matter, and the second type, in which the axon never leaves the grey matter; these are the intercalary neurons. They always intervene between neurons of the first type and in the cerebral cortex they form definite layers especially well developed in the sensory projection centres—e.g., of vision and hearing. I will endeavour to show how retraction of the branching processes of these intercalary cells would shut off consciousness of the external world. These intercalary neurons possess only a small amount of cytoplasm, and are therefore unable to store oxygen. Sudden failure of the heart's action by shock, whether of physical or emotional origin, lowers the oxygen tension in the tissues and a dissociation of the sensory projection neurons from the cortical perceptor neurons occurs.

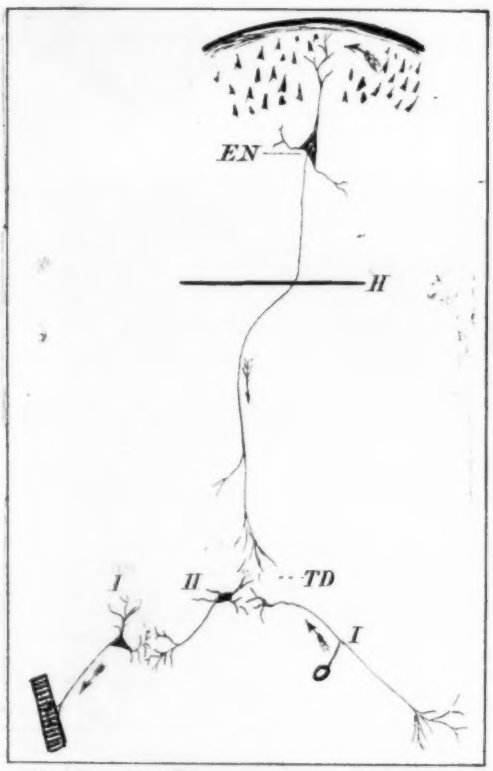
The whole of the neurons of the central nervous system may be primarily divided into these two groups. 1. Neurons of the first type which may again be divided into sensory or afferent projection, motor or efferent, and association neurons. 2. Neurons of the second type or intercalary. To take a few typical examples of the influence of shock affecting one part of the central nervous system being transmitted through anatomically and functionally correlated neurons to remote parts. In hæmorrhage into the internal capsule we have a sudden irruption of blood cutting through the pyramidal efferent system of fibres resulting in a flaccid paralysis of the opposite limbs (Fig. 1); the shock effect has been transmitted to the intercalary neurons at the base of the posterior horn of the spinal cord, and for the time being it has suspended the normal reflex tonus, that is to say, dissociation of the sensory projection fibres of the reflex arc has occurred. But we know that as soon as the shock effect has passed off a spastic condition supervenes on the flaccid. The reason of this is that the normal inhibitory cortical influence has been interrupted and association of the sensory

afferent and motor efferent in the reflex arc having been restored by a return to normal function of the intercalary neurons, the reflex tonus is increased by withdrawal of the cortical inhibitory influence. Let us take another example of which I have seen several: a bullet wound of the occipital region of the skull causes complete blindness, but not deafness. After a time the patient is left with hemianopsy; the fact that the wound did not produce deafness shows that it was not general shock to the brain that led to the opposite occipital lobe being temporarily put out of function (Fig. 2). The two occipital lobes are anatomically and functionally correlated, and the injury of one lobe caused a functional dissociation by the shock effect transmitted through the association fibres of the splenium. This temporary dissociation by shock of anatomically and functionally correlated systems of neurons has been termed by Monakow diaschisis.

THE LIVING NEURON IN RELATION TO SHOCK.

The researches of Ross Harrison on the living neuron and its growth render it possible to accept as a provisional hypothesis the theory of attraction and retraction of dendrons as an explanation of association and dissociation. The intercalary neurons may, indeed, possess amœboid movement. A study of the living neuron shows that totally erroneous ideas may arise if we are guided by the appearances presented by the neurons in sections

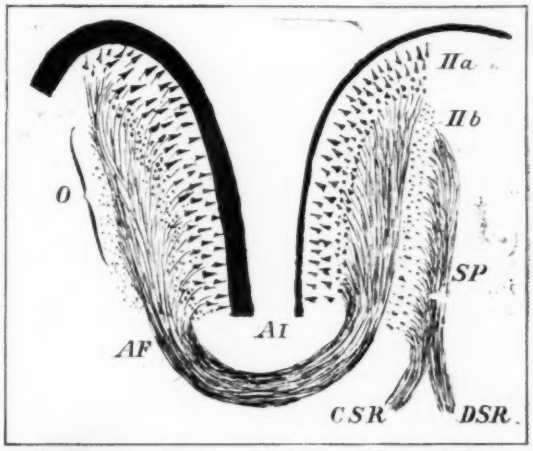
FIG. 1.



Diaschisis. EN = Effector neuron of voluntary movement. H = Seat of hæmorrhage in internal capsule causing shock transmitted to terminals in reflex arc of spinal cord. TD = Temporary intercalary dissociation of reflex arc by shock.

after they have been submitted to hardening and fixing reagents. Especially is this so in respect to the effects of shock by concussion generated by high explosives. The remarkable observations of Colonel Gordon Holmes on gunshot injuries of the spine causing concussion of the spinal cord without penetration by the projectile of the dura mater, show the importance of a consideration of the living neuron. The force of the

FIG. 2.



Diaschisis. O = Injured occipital lobe. AF = Association fibres through which shock effect is transmitted to opposite occipital lobe. AI = Fibres of splenium. II = Two layers of intercalary cells—(*a*) association, (*b*) sensory receptors. SP = Sensory projection. CSR = Crossed sensory receptor fibres. DSR = Direct sensory receptor fibres.

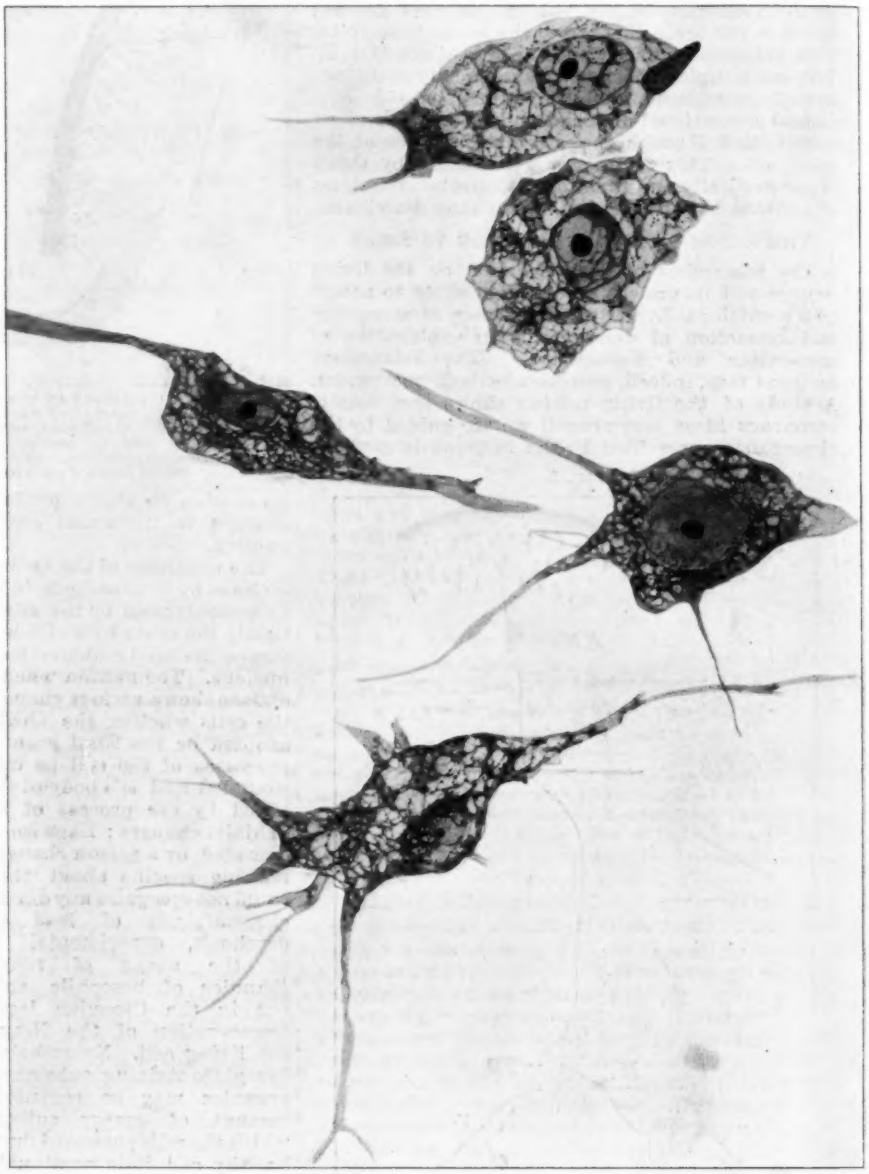
concussion he shows produces most extraordinary changes in the axons which become enormously swollen.

The condition of the nerve cell may be studied in sections by two methods, in one of which fibrils can be demonstrated by the silver method of Ramon y Cajal; the other by which a basophile staining substance (the Nissl granules) forms a pattern around the nucleus. The neuron when damaged by injury or disease shows various changes in the appearances of the cells whether the fibril method of staining be adopted or the Nissl granule method—e.g., if the processes of the cell be cut, the living neuron is wounded and the body of the cell after it has been killed by the process of fixation and hardening exhibits changes; likewise if the neuron has been damaged by a poison changes are seen, but there is nothing specific about these changes—e.g., one could not recognise any difference in the perinuclear chromatolysis of lead encephalitis, alcoholic psychosis, experimental anæmia and section of the axons of nerve cells. The Nissl granules of basophile substance, as I pointed out in the Croonian lectures 1900[1]—"On the Degeneration of the Neuron"—do not exist in the living cell. Nevertheless, the amount of this basophile staining substance in the form of Nissl granules may be regarded as evidence of the amount of energy substance (neuro-potential) which the cells possessed during life (Fig. 3). In the healthy cell it is continually undergoing disintegration and automatic reintegration. When the cell is damaged metabolic equilibrium is no longer maintained, and its osmotic surface-tension is altered and water passes into the cell causing it to swell, displacing the nucleus and causing an appearance of chromatolysis. But this basophile staining substance which forms the Nissl granules does not exist as such in the living cells. If the living nerve cell be examined by direct illumination, no Nissl bodies are seen in the cytoplasm,

[1] THE LANCET, June 23rd, 1900, p. 1779.

only fine dark granules like an emulsion (Fig. 4). If living cells are examined microscopically with dark-ground illumination (Fig. 5) they are seen to be filled with small granules or globules, each of which after escaping from the cell remains discrete. They are refractile and appear white and luminous; this is due to a delicate covering film of a lipoid substance which encloses a colloidal fluid, probably consisting of a solution of salts and cell globulins. When the cell dies this colloidal fluid is coagulated and the precipitated proteid substance is massed together into little blocks—the Nissl granules; the intervening denser colloidal substance is continuous with the colloidal substance of the axon and dendrons. The film that covers each globule is stainable by vital methylene blue, and a living nerve cell stained by vital blue represents the appearance of an emulsion of minute faintly blue globules. If the living cell thus stained be kept in an atmosphere of nitrogen in a warm chamber the stored oxygen is used up and a leuco-base is formed, causing the globules to lose their colour, the cell appearing of a greenish tint. On admission of oxygen the living cell again becomes blue. It thus appears possible[2] that these granules represents a large oxygen surface, like spongy platinum, within the cell. When the cells die the lipoidal film of the globulin containing fluid is destroyed, coagulation occurs, and the Nissl granules are formed. These facts accord with the knowledge that stimulation of a piece of nerve causes practically no metabolic change or using up of oxygen, therefore the mere conduction of a stimulus along a nerve does not entail loss of neuro-potential. The chemical processes incidental to the using up of nervous energy in the neuron take place in the cell itself, and for this reason it is that the blood-supply of the grey matter is six times that of the white matter. In all active neural processes oxygen is used up and carbonic acid is produced which escapes into the circumambient cerebro-spinal fluid. One stimulus differs from another that is discharged into a cell by variation in modes of motion, and it is conceivable that the granules which fill the cell are sensible to the varying modes of motion, and an

FIG. 3.

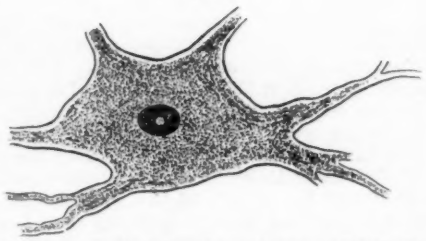


Five cells from a case of a man who lived eight hours after receiving an electric shock of 20,000 volts. A very diffuse chromatolysis with loss of basophile staining substance, thereby revealing the intracellular and intranuclear networks, is observed. Polychrome staining. Magnification 810.

[2] The experiments relating to the living cell were commenced before the war, and I have not had time or opportunity to prosecute this research further; I therefore put forward this hypothesis tentatively.

oft-repeated stimulus suffices by the establishment of a biorhythm in the cell to pass through to the intercalary neuron with little expenditure of neuro-potential, whereas a new stimulus which requires a concentration of attention must be either transformed or reinforced before connexion of the

FIG. 4.



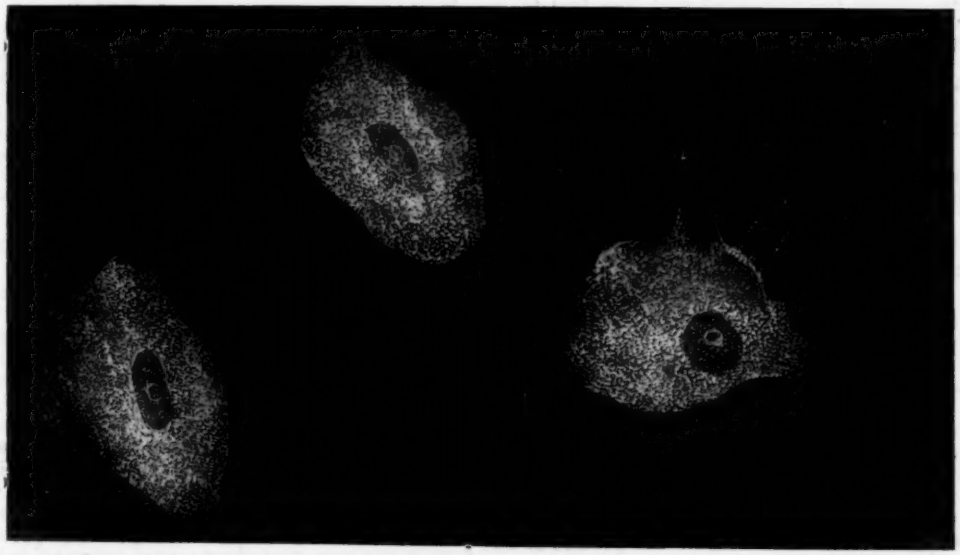
Anterior horn cell of spinal cord examined immediately after death by direct illumination. The grey matter was teased in cerebro-spinal fluid and the preparation examined on a warm stage. The cell is seen to possess no Nissl bodies, but is filled with dark granules like an emulsion. (Obj. 4 mm., oc. 4.)

terminals of Neuron I. with Neuron II. (see Fig. 1) can take place, and this involves a using up of neuro-potential. Severe concussion can not only cause immediate dissociation of the cortical perceptor neurons, producing unconsciousness or a disturbance of conscience, but for a varying period of time it can destroy the power of recollection of perceptions prior to the shock. There is a retrograde amnesia, and in very severe cases of shell shock, as I shall point out later, there may be a complete loss of memory both as regards recollection and recognition. The loss of recollection may be attributed to dissociation of the higher association systems of from the perceptor systems of neurons. Functional blindness and deafness which often persist when consciousness returns may be due to one afferent system remaining dissociated.

But why, it may be asked, do we find varying degrees of retrograde amnesia associated with loss of recollection of recent experiences, while those of earlier life may be preserved? Shock so severe, or toxic influences such as alcohol do not cause dissociation of the neurons in which habitual actions by frequent repetition have been registered, and their revival requires a much less expenditure of neuro-potential the more they have become habitual and instinctively automatic. For the same reason the earlier experiences have been stored in memory, the more do they form the foundation upon which associative memory rests, for consciously and unconsciously these early experiences have been exerting continually their influence on the subconscious mind by association, and at the same time they have determined and been correlated with habitual and instinctive actions, requiring but little conscious effort and expenditure of neural energy.

The delicate granules filling the nerve cells have been termed "neuro-bions," as if they were independent living units, but this is theory. It is, however, conceivable that violent concussion transmitted to the cerebro-spinal fluid, which forms the circumambient medium of such a complex mechanism as the living nerve cell, could cause a violent oscillation of these neuro-bions and a loss or disturbance of their functions of variable duration according to the severity of the shock. I show here (Fig. 3) the appearance presented by the cells of the medulla of a man who died eight hours after receiving a shock of 20,000 volts.

FIG. 5.



Drawing of an anterior horn cell (right hand) with processes and two posterior spinal ganglion cells as seen by dark-ground illumination while still in the living state. The cells are teased out of the tissue in warm cerebro-spinal fluid or Ringer's fluid. The microscope is placed in a warm chamber with a glass front. In this way the living cells can be observed for some time. (Obj. 4 mm., apochrom. oc. 4.)

(pyramidal) neurons which form a sheet of cells of three layers covering the whole cortex cerebri. The loss of recognition may be attributed to a dissociation between the cortical perceptor systems of neurons, and in complete loss of consciousness of the external world there is dissociation of all the afferent projection fibres of subcortical neurons

OXYGEN AND CONSCIOUSNESS.

It is known that a continuous supply of oxygen is essential for consciousness. The bulk of the cortex is supplied by the internal carotid arteries; compression of these arteries causes loss of consciousness in about five or six seconds. Histological investigation tends to show that the intercalary

neurons have no store of oxygen in their cytoplasm; they depend, therefore, upon a continuous renewal of the oxygen in the circumambient fluid; consequently as soon as the capillary circulation ceases they feel the effect of lack of oxygen and cease to function, causing dissociation to occur. Now a violent emotion such as fright can by its influence on the vaso-motor centre and the heart's action, causing a fall in the blood pressure, produce an immediate lowering of oxygen tension in the fluid, and thereby suspension of function of the intercalary neurons of the cortex, followed by dissociation of the cortical perceptors and loss of consciousness. In many of the disorders of functions and loss of functions of the central nervous system resulting from shell shock, using that term in its widest sense, there occur symptoms of cortical dissociation—e.g., cortical blindness, deafness, mutism, and paralysis.

The symptoms of headache, weariness, loss of power of concentration, irresolution, and mental fatigue constituting a neurasthenic condition so frequently found as a result of shell shock may be explained by the acquirement of the habit of drawing on the reserve of neuro-potential, and being unable through insomnia or sleep disturbed by terrifying dreams, worry, and anxiety to restore the balance and return to the normal conditions of automatic renewal of nervous energy as fast as it is used. Physical shock accompanied by horrifying circumstances, causing profound emotional shock and terror, which is contemplative fear, or fear continually revived by the imagination, has a much more intense and lasting effect on the mind than simple shock has. Thus a man under my care, who was naturally of a timorous disposition and always felt faint at the sight of blood, gave the following history. He belonged to a Highland regiment. He had only been in France a short time and was one of a company who were sent to repair the barbed wire entanglements in front of their trench when a great shell burst amidst them. He was hurled into the air and fell into a hole out of which he scrambled to find all his comrades lying dead and wounded around. He knew no more, and for a fortnight lay in hospital at Boulogne. When admitted under my care he displayed a picture of abject terror, muttering continually "no send back," "dead all round," moving his arms as if pointing to the terrible scene he had witnessed.

THE NATURE OF HIGH EXPLOSIVES AND FORMS OF PROJECTILES.

Sir Anthony Bowlby in the Bradshaw Lecture on "Wounds in War"[3] called attention to the nature of high explosive shells and their terrible effects. "These shells vary in weight from a few pounds to about a ton, and they consist of a thick iron case containing in a central cavity a violent explosive charge. The latter is in the case of German shells trinitro-toluene, and may contain as much as 200 pounds of this explosive. Such shells are burst upon percussion by a detonator which acts by the impact of the shell upon the ground or on some other object. These shells do not contain bullets, and the injury they do is in chief part by the jagged fragments into which they are split by the explosion, and also to some extent by the impact of portions of buildings such as stones or bricks which are scattered with immense force by the violence of the explosion. [He might have added sandbags forming the parapet of a trench or he roof of a dug out.] The fragments of the shells are always very rough and jagged and of every variety of size and shape. For example, the base of a 17-inch shell may weigh 150 pounds, and if it struck the body of a man would completely destroy it. Other fragments may weigh a few pounds and may tear off a limb or crush it to pulp, while in the smaller shells there may be scores of fragments about the size of the end of the finger or much smaller. It must also be borne in mind that the mere explosive force of the gases of a large shell exercises great powers of destruction. The expansion of the gases is sufficient to kill, and in the only case in my experience in which an autopsy has been made the brain was the seat of very numerous petechial hæmorrhages." This brain, by the kindness of Professor Arthur Keith, has come into my possession and the result of the microscopic examination I shall deal with fully in my next lecture. Suffice it to say that the appearance it presented led me to suspect CO poisoning. But high explosives are used also in mines, and in various other forms of projectiles such as aerial torpedoes, whizz bangs, and grenades. It is, however, the big shells and mines which are so deadly in producing fatal or serious effects on the central nervous system without visible external signs of injury.

The following cases show the great force generated by high explosives.

A lieutenant under my care told me that he was in a communication trench when an aerial torpedo exploded close to him. He felt a great pressure against him; it was soft but sufficiently powerful to knock him down unconscious. He did not know how long he was unconscious, but thinks it must have been an hour. When he recovered consciousness he got up and was helped away. His head felt as if it would burst, and ever since he has had a whizzing in the left ear and dizziness. Dreams of bombs and aerial torpedoes bursting. There was no parapet to blow down on him.

A captain in the R.A.M.C. told me that a large shell burst at his back, and he was blown 15 yards by the aerial disturbance.

An R.A.M.C. officer at the battle of Ypres had a shell explode near him. He was not hit, but lay unconscious for six hours. He recollects the shock of the shell as he went out of the dressing-room. For some days he suffered with severe headache and soreness of back of head and down the spine; the lower extremities felt heavy, but there was no loss of feeling. He had retention of urine for a day only, and around the body there was a pain like an appendix pain. He rapidly recovered.

THEORIES REGARDING CAUSATION OF INSTANTANEOUS DEATH OF GROUPS OF MEN.

At various times, from the earliest periods onwards in the war, journalists have given vivid descriptions of shell fire causing instantaneous death of groups of men. Ashmead Bartlett in his graphic description of fighting in the Dardanelles relates what he found in "A Valley of Death." "In one corner seven Turks, with their rifles across their knees, are sitting together. One man has his arm around the neck of his friend and a smile on his face as if they had been cracking a joke when death overwhelmed them. All now have the appearance of being merely asleep; for of the seven I only see one who shows any outward injury." How can we explain death without apparent bodily injury yet so instantaneous as to fix them in the life-like positions and attitudes thus realistically described? Did rigor mortis come on immediately and what was the cause? Officers and soldiers have told me that they have felt ill and vomited with the gases generated by these high-explosive shells. A Canadian officer told me that in the first gas attack made by the Germans he felt ill and vomited with the

[3] THE LANCET, Dec. 25th, 1915, p. 1385.

gases generated by the high-explosive shells. The smell has, like that of bananas, a faint sickly odour that made him feel ill and vomit, and quite different to the "gas." In considering the causation of fatal shell shock without visible sign of injury it is necessary, therefore, to take into account chemical changes in the atmosphere together with the physical forces generated by the explosive. The effect of the emanation of a poisonous gas was the explanation at first given for instantaneous death without physical sign of injury; it was widely bruited about that turpinite, a French high explosive, produced a deadly gas which would be quite capable of producing sudden death without visible signs of injury; but the question even then arises, Why should the body remain in a life-like position? Many authorities regard it as much more likely to be due to the effects of concussion on the nervous system. Cases that have recovered after severe concussion without visible sign of injury may, nevertheless, have received physical concussion by sandbags blown down from the parapet into the trench, or if the shell burst in a dug-out, the earth may be driven down with great force, burying the inmates. A case, however, came under my care, in which there was no history of this happening, from No. 6 C.C.S., 24–25/9/15, as follows:—

> This man was blown up by a shell and was found in the dug-out with his two comrades, both of whom were dead. While here he has been quite insensible to all questions. He has been in a cataleptic state, with at times convulsive seizures. His light reflexes are present.
>
> He was removed to No. 30 C.C.S.I., and further notes state:—"Reflexes very active. Urine drawn off 1 pint; when tested showed marked albumin. Both pupils widely dilated. Speaks incoherently occasionally. There is *no outward evidence of any injury* or symptoms of pain anywhere. Five days later he was admitted to the 4th London General Hospital. He complained of a strange feeling in his head and sweated profusely. He was terrified when the corporal in charge shook him to try and stop his shouting and mumbling. He complained of severe headache of the vertex, shook a good deal, and said everything in front of him looked blurred. He could hear and comprehend what was said to him, and spoke in reply to questions; subsequently he made a complete recovery."

The fact that there was albumin in the urine when it was drawn off and no visible sign of injury suggests that inhalation of noxious gases in a closed space was an important contributory cause of the death of his two comrades and of the severe temporary symptoms which he manifested. But it might be argued if poisonous gases generated by the explosion cause death, it is only by inhalation while the man is lying on the ground unconscious or partially buried, and this would not account for the sudden death where groups of men are found fixed in the last act of life. M. Arnoux, a French civil engineer, has studied this question and has suggested another theory which is extremely interesting. A pocket aneroid barometer carried by an officer had been exposed to an explosion of the kind referred to, and was put out of working order by the force of the concussion. M. Arnoux had the aneroid repaired; he then placed it under the reservoir of an air pump and exhaust until he had produced the same effect on the aneroid as was observed before it was repaired. He calculated from observations and experiments that the dynamic pressure exerted by the surrounding air on bodies within a few yards of the exploding shells had amounted to over 10,000 kilos per square metre. Men standing close to the exploding shell would be blown into the air or dashed against the ground with great violence, but in the case of men leaning against the side of a trench wall only the static depression could affect them. What, M. Arnoux asks, would be the effect on the human organism of so powerful and so sudden a decompression? It would, he answers, be similar to that which causes the deaths of aeronauts who make too rapid an ascent or of workers in compressed air caissons who leave their caissons too quickly and without taking proper precautions for their slow decompression—namely, the sudden escape from the blood of bubbles of air and CO_2 which would produce capillary embolism throughout the body and cause sudden death. M. Arnoux's theory is, then, that the sudden increase of atmospheric pressure produced by the explosion is capable of producing an immediate increase and absorption of air and CO_2 followed by a sudden liberation on return to normal conditions.

Surgeon-General Stevenson,[4] commenting upon the theory of M. Arnoux, asks: "Is it possible that a sudden increase of atmospheric pressure, lasting only a fraction of a second, no matter how great it might be, could so charge the blood with gases that their discharge into the blood stream when the pressure ceases would cause death in the same manner as a too rapid return to ordinary atmospheric pressure in caisson workers?" He advocates the theory of concussion of the central nervous system as the most satisfactory explanation; the water jacket of the cerebro-spinal fluid serves as a protection to the vital centres of the medulla under all ordinary conditions of commotio cerebri. But in these cases (as M. Arnoux's experiments prove) we are dealing with extraordinary conditions of atmospheric pressure: a pressure force which we believe is sufficient to cause a temporary loss of consciousness, temporary blindness, deafness, paralysis, and loss of speech without any visible signs of injury. If the functions of the higher centres are for a time instantaneously suspended by the shock, it is conceivable that in the severest cases the functions of the vital centres of the medulla may be instantaneously suspended by its concussion; moreover, the hæmorrhages in the corpus callosum and the basal ganglia found in the brain referred to might be explained by the fact that the ventricles are filled with incompressible fluid to which the violent shock is transmitted.

The cases that have recovered after severe shell shock very rarely show signs or symptoms of organic disease.

But suppose the air is charged with carbon monoxide and oxides of nitrogen, would it not be possible for the man to inspire enough of these gases to cause instant death? I wrote to Professor Leonard Hill on this subject, and I received the following very interesting reply:—

> The explosion of a big shell in a trench, dug-out, cellar, or other confined space must, I think, instantly deoxygenate the air and produce a high concentration of carbon monoxide and oxides of nitrogen. The inspiration of a man at the moment of explosion may introduce enough of these gases to cause death from want of oxygen. If he is fatigued his muscles will be in the condition to go into rigor on the sudden deprival of oxygen. It would be of great interest to get samples of blood from men killed by shell shock. I do not see how the alteration of air pressure can do more than act on the gas in the guts and on the lung. The sudden compression of the lungs by several atmospheres must be considered. The pressure will probably act quicker through the wall of the thorax than down the trachea. I do not see how a sudden squeeze of the thorax is going to do any harm, and the

[4] Note on the Cause of Death due to High-explosive Shells in Unwounded Men, Brit. Med. Jour., Sept. 18th, 1915, p. 450.

pressure will be equally distributed through the fluids of the body in all directions, and it is not enough to break the thoracic wall by the sudden compression of the gas in the lungs. A copper ball with a glass tube sealed up full of air sunk in the deep sea is broken in when the glass tube bursts in spite of a free opening into the copper ball. I imagine the thoracic wall might be broken in by a sufficient sudden pressure. The elasticity of the atmosphere is such that this does not occur. I once carried out some experiments on the effect of exploding heavy charges of gun-cotton on pigs. A few feet of air was enough to save the pigs from damage. When the gun-cotton exploded near the ground the soil, stones, &c., were converted into missiles and these wounded the pigs. The lungs of these pigs showed some patches of emphysema, as if the sudden wave of air pressure had driven air from one part of the lung into other parts.

I should say the men either die, as you suggest, from the gases—deoxygenation of blood—or else from concussion.

Also through Lord Sydenham I have heard from the secretary of the Trench Warfare Department that it is possible that the partial detonation of a large shell containing, say, 50 to 100 lb. of T.N.T. would produce enough carbon monoxide in the immediate vicinity to give rise to the characteristic poisonous effects of this product.

Investigations
ON
CLINICAL THERMOMETRY:
CONTINUOUS AND QUASI-CONTINUOUS TEMPERATURE RECORDS IN MAN AND ANIMALS IN HEALTH AND DISEASE.

BY G. SIMS WOODHEAD, M.A., M.D., LL.D.,
PROFESSOR OF PATHOLOGY, CAMBRIDGE;
AND
P. C. VARRIER-JONES, M.A., M.R.C.S., L.R.C.P. LOND.,
FOUNDATION SCHOLAR, ST. JOHN'S COLLEGE, CAMBRIDGE.
(*From the Pathological Department, University of Cambridge.*)

PART III.*—THE ELECTRICAL RESISTANCE THERMOMETER.

IN 1901 Professor Benedict and Dr. John Snell published[74] a series of observations on the temperature of the human body measured by means of an electrical resistance thermometer, a form of thermometer now largely used in pyrometer work by Callendar, Feré, and others. The method employed was not absolutely automatic or continuous as the electrical circuit had to be closed by hand every minute and the deflection of the galvanometer noted. Referring to this method Gamgee remarks:—

> Admitting as I do that Professor Benedict's observations possess a very much higher value than any which preceded them, I still think that his method left the problem of the automatic registration of the temperature of man unsolved.

Three years earlier than this (1898) Adami, who desired to make observations on the diurnal variations of the temperature of the human body, suggested to Professor H. L. Callendar,[75] then of Montreal, but afterwards of London, where he collaborated with Gamgee, that he should devise electrical resistance thermometers similar to those used in the pyrometer, but specially adapted for recording the temperature of different parts of the animal body.

In 1904 Ronald Ross,[76] using a resistance thermometer and recording outfit placed at his disposal by the Cambridge Scientific Instrument Co., obtained 24-hour record temperature curves, a couple of which he publishes. He gives the curve, however, without marking the temperature at any point except in terms of axillary temperature taken with the clinical thermometer. There is no standard therefore for the rectal temperature except that obtained from a comparison with the axillary temperature. His curves are, however, of interest as indicating that this method of recording temperatures had now reached the hands of the medical man, having been passed on from the physicist.

At the same time similar work was carried on in Germany, and Siemens and Halske constructed an electrical resistance thermometer with switchboard and recording apparatus, the galvanometer needle making a tracing on the flat. This apparatus was in many ways admirable, but it had the disadvantage that the record was in the form of the segment of a circle with a radius of the length of the galvanometer needle or lever. In 1911 and 1912 Drs. Eichler and Schemel[77] published a couple of papers on work done with an improved recorder in which a pointed chopper bar and inked-ribbon method of obtaining a dotted record was used. The records obtained with this apparatus are excellent.

In planning out our work on the temperature of bovine animals in health and disease we soon came to the conclusion that the thermo-electric couples above described were too delicate in their construction and required the use of too complicated apparatus. We determined, therefore, to adapt the resistance thermometer to our requirements and to use a thread recorder with a stronger phosphor-bronze wire suspension, a much more robust instrument than that provided with the delicate suspension essential for use with the thermo-electric couple thermometer. A switchboard for standardising and fixing the range of temperature was also used. With this apparatus we were so successful in obtaining accurate temperature records from animals† that we decided to adopt it for work in the wards, and one of us (P. C. V.-J.) undertook to adapt the resistance thermometer to the human subject, a thermometer with which all our later work has been done.

DESCRIPTION OF NEW OUTFIT.

Our new outfit may be considered under the following heads: (1) The electric resistance thermometer and its leads; and (2) the switchboard for standardising the recorder by fixing the range and limits of temperature.

The thermometer constructed for us by the Cambridge Scientific Instrument Co. is a Callendar-Griffiths platinum electrical resistance thermometer with certain modifications, the outcome of our experience. The essential part of this instrument is a fine platinum wire wound round a couple of strips of mica (Fig. 14) notched at both sides and so arranged that they form an elongated frame into the notches of which the coiled platinum wire drops, and is held in position. This coil, on its frame, is enclosed in a silver (an excellent conductor) tube, which lies close up to, without coming into actual contact with, the wire.

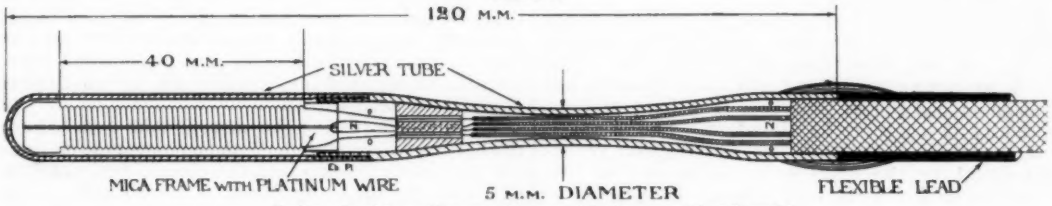
The thermometer coil is connected by comparatively heavy flexible leads, composed of a series of strands of copper wire, to the Wheatstone bridge or

* Parts I. and II. were published in THE LANCET, Jan. 22nd (p. 173) and Feb. 5th (p. 281), respectively.

† Journal of Comparative Pathology and Therapeutics Edinburgh and London, 1915, vol. xxviii., pp. 337-357.

instrument on which the resistance (and the temperature) is to be measured by means of the deflection of a galvanometer. Parallel, and in addition, to these primary leads run two similar copper wires or dummy leads which, though in close proximity to the leads of the platinum coil, are joined at their ends near to, but independent of, this coil. These leads are introduced into the side of the bridge opposite to the side to which the thermometer leads are attached, and act as "compensating" leads (Fig. 14 N), thus rendering the outfit practically independent of any changes in the length or temperature of the primary leads. The two sets of leads simply throwing in or withdrawing equal resistance on both sides of the bridge, no error is introduced, and any length of leads may be used. Beyond the actual thermometer part, the platinum wire coil, the leads are held together by, and covered for some distance with, a length of rubber tubing (Fig. 14).

FIG. 14.



Section of resistance thermometer as used for human subject (to scale).

The electrical resistance of the platinum wire varying with the temperature in a very definite manner according to a well-known law ‡ it is possible, by measuring this resistance, to determine the temperature to which the platinum, which thus acts as a thermometer, is brought, the variations of resistance and therefore of temperature being registered automatically by the recorder. The current used is supplied by a 4-volt accumulator with which an adjustable rheostat is in series. This accumulator is thrown into the circuit by being placed across two arms of the bridge. (Fig. 15.)

A skin thermometer, up to the present applied only experimentally, consists essentially of a coil of fine platinum wire of definite and known electrical resistance wound on a silver backing about 1¼ in. square and heat-insulated from it. The platinum is embedded in a "shellac"-ed surface which is intended to be laid flat on the skin, thereby affording fairly intimate contact and at the same time ensuring good electrical insulation and immunity from mechanical damage to the wire. The silver back has two small silver lugs provided for fixing a holding strap if required. The thermometers are supplied with their respective resistance coils, making them interchangeable and enabling them to be used on the same recording instrument as the rectal thermometers. Into the leads of each thermometer a suitable rheostat is introduced; with this arrangement any thermometer may be used and all become interchangeable.

The recorder is illustrated in Fig. 13,§ the box containing the bridge coils, with the plugs and battery rheostat on the right of the recorder.

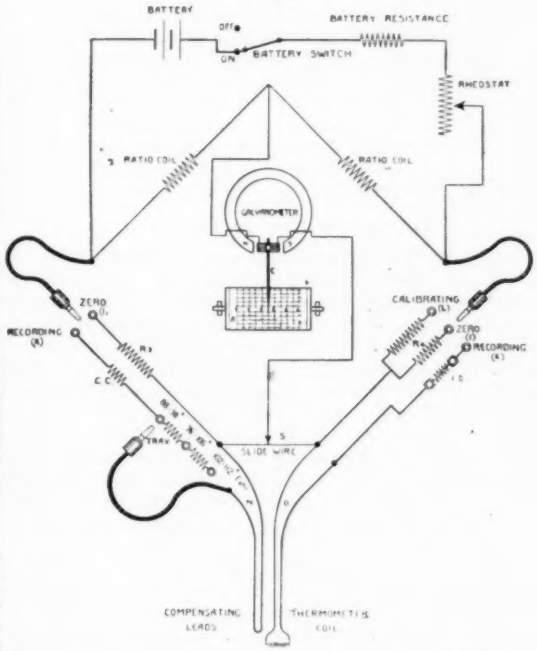
The bridge is of a simple character and is shown diagrammatically in Fig. 15. It consists of a pair of equal ratio coils which are balanced against the thermometer coil with its accessory coil I.C. and the compensating leads with accessory coil C.C.

When the thermometer coil is heated the bridge is thrown out of balance and the galvanometer needle deflected, the deflections over a small temperature range being proportional to the amount the bridge is out of balance—that is to say, to the amount of increase in the resistance of the thermometer coil with a given change in temperature.

TESTING THE RESISTANCE.

In order to obtain correct temperature readings it is necessary to standardise the thermometer. This is a simple procedure and can be done rapidly. With the switch off—i.e., before any current is passed through the apparatus—the mechanical zero of the galvanometer must be determined. The needle should hang at rest at the outermost line (say 96° F.) at the lower end of the record. If it is not in this position the torsion head, Fig. 11 U and Fig. 12 U, from which the galvanometer coil is suspended is rotated until the needle hangs on the line. This done, the electrical zero should be fixed. With the switch still "off" the two plugs shown on the right and left hand sides of the diagram

FIG. 15.



are placed in the plugs I and I′ marked "zero." (Figs. 13 and 15.) If the connexions are then traced through in Fig. 15 it will be seen that the thermometer coil, O, and the compensating leads, N, are both cut out of the circuit and that the bridge consists of two ratio coils and two other coils R_3 and R_4. Switch the current "on," and if the galvanometer

‡ Professor H. L. Callendar (75) in a long series of researches has proved the reliability and accuracy of the platinum resistance thermometer, and his work has been confirmed by many other observers.

§ Fig. 13 appeared in Part II. in THE LANCET of Feb. 5th.

needle does not then hang correctly it shows that there is too great a resistance on one side or other of the bridge. This is corrected by moving the slider (S) right or left on the slide wire. (Fig. 15, S.) A small movement of this slider (or slight rotation of the button in the centre of the switchboard, Fig. 13) should bring the galvanometer needle to the correct position—viz., 96° F.

The next operation is to test whether the galvanometer needle (E) is deflected correctly for a definite change in the resistance of the circuit. This might be done by warming the thermometer, but experience has shown that this is a long process, especially if accuracy be aimed at. The simplest plan, therefore, is to introduce a manganin resistance equal to the change in resistance of the thermometer for a definite number of degrees of temperature. In practice the equivalent of a change in temperature of 10° F. is used. Turn the switch off and shift the plug on the right-hand side of the diagram from the zero position to that of the calibrating position L and pull the switch "On." This introduces a resistance equal to R_1 plus a resistance equivalent to a change in the resistance of the thermometer coil for 10° F. The galvanometer needle should now be deflected till it marks 106° F. If it is not, then the current flowing through the battery circuit is insufficient, and the position of the slider on the battery rheostat must be altered to increase the current passing through the galvanometer until it is deflected through a larger angle—viz., through the equivalent of 10° F. on the paper. If too large a deflection is given the slider should be moved in the opposite direction in order to reduce the current in the circuit. These adjustments having been made, the two plugs are shifted into the recording positions K and K′, and the instrument is ready for use and should operate correctly and without difficulty.

The ranges in temperature are varied by means of the travelling plug shown in the compensating leads circuit. If a temperature range across the paper from 88° to 98° F. is desired the plug is inserted in the plug hole marked 88–98°. If a higher range is required the plug is inserted in either of the two other plug holes marked 96–106° and 102–112° respectively (Fig. 15).

METHOD OF USE OF APPARATUS.

This apparatus, then, consists essentially of (*a*) a platinum wire through which can be passed a constant electric current provided by (*b*) a 4-volt accumulator. This current, after passing through the platinum wire, is sent through (*c*) a galvanometer, the deflection to right or left of the galvanometer needle marking the diminished or increased resistance of the platinum wire as the result of change of temperature of that wire. The accessory apparatus serves to regulate and standardise the current and to alter the excursion of the galvanometer needle in order that the zero may be fixed and the range of the temperature record adjusted.

On studying the diagram (Fig. 15) carefully the connexions of the instrument are readily understood, and it is an easy matter to take a record. Level the apparatus. The galvanometer needle should then be at zero before the battery current is thrown in. To test this, unclamp the galvanometer needle by turning key, V (Figs. 11 and 12) (or in another model move the lever) at the back of the galvanometer which regulates the torsion of the spiral phosphor-bronze wire suspending the needle. Fix a chart paper on the drum with the numbered side close up to the shoulder at the gear-wheel end of the drum, start the clocks and release the fly-wheel, G_2, and the presser-bar nipping the inked thread against the paper, a dot is made. If this dot falls on the zero line the apparatus is accurately adjusted; if not, the needle should be adjusted by means of the screw as described above. This movement is extraordinarily sensitive and requires some considerable care in its use, but once the correct zero is obtained there should, under ordinary conditions, be no further demand for adjustment.

When standardising the current take care to keep the battery fully charged. With the battery so charged the current is thrown into the circuit, but not into the leads, by inserting plugs at I zero and I′ zero. Throw the switch lever "on" to complete the battery circuit, when the needle should remain at zero. If the galvanometer needle is not at zero too much or too little current is passing through the circuit, and this must be counterbalanced by the rheostat. The next step is to find the excursion of the needle. The current is switched "off" and the two plugs are inserted at I zero and L, when the needle should travel the full length of the scale 10° F. but no more. If it fails to do this the needle must be brought to the correct position by means of the small sliding resistance (S).

Before making any of the above connexions take great care always to change the lever to "off," otherwise the whole current passing through the galvanometer causes violent deflection of the needle and "strain" of the coil and diminution of its sensitivity may result.

The apparatus is now ready for the taking of a record. Having inserted the thermometer, slightly warmed, into the rectum, the plugs are inserted at K and K′, the current is switched "on" and the clock started. This should be done as soon as the thermometer has had time to register the temperature of the body—about 5 minutes.

Bibliography (Part III.).—74. Benedict and Snell: Eine neue Methode um Körpertemperatur zu messen. Pflüger's Archiv f. d. ges. Physiol., Bonn, 1901, lxxxviii., 492–500; Körpertemperaturschwankungen mit bes. Rücks. auf den Einfluss welchen die Umkehrung der tägl. Lebensgewohnheit beim Menschen ausübt, ibid., 1902, xc., 33. 75. Callendar: On the Practical Measurements of Temperature. Experiments made at the Cavendish Laboratory, Cambridge (abstract). Proc. R. Soc., London, 1887, xli., 231, and in Phil. Trans. Roy. Soc. Lond., (A) vol. 178 for 1887 (1888), pp. 161–230; Notes on Platinum Thermometry. Phil. Mag., London (5), xlvii (1899), 191; Electrical Recording Thermometers for Clinical Work (In Memoriam Dr. Gamgee). Proc. Physical Soc. of London, 1910, xxii., 220, also in Phil. Mag., London, April, 1910, (6) xix., 538. 76. Ross (1904): The Platinum Thermometer and Callendar Electric Recorder for Obtaining Continuous Clinical Temperature Charts, THE LANCET, i., 585. 77. Eichler and Schemel: Ueber die Beeinflussung der Magentemperatur durch verschiedene hydrotherapeutische Applicationen und ihre Messung mit dem "Fieberregistrierapparat" (nach Siemens and Halske). Deutsch. med. Wochenschr., 1911, Leipzig, Band xlviii., S. 2371; also Schemel and Eichler: Ueber Temperaturmessungen im Darm mit dem Fieberregistrierapparat von Siemens und Halske bei verschiedenen hydrotherapeutischen Maassnahmen. Berlin. klin. Wochenschr, 1912, Band xlix., S. 60.

(To be continued.)

ROYAL UNITED HOSPITAL, BATH.—The annual meeting of the subscribers to this hospital was held on Jan. 31st. The medical report was satisfactory, but the financial statement showed a deficiency on the year of over £2000. The chairman (the Mayor) stated that Bath had raised about £25,000 for war funds, but the committee hoped that at the termination of the war it would be possible to place the charity again in a sound financial position.

Dr. Willoughby Mason Willoughby, the deputy medical officer of the Port of London and senior boarding medical officer, has been appointed by the City Corporation to succeed the late Dr. Herbert Williams as medical officer of health of the port.

THE AERIAL CONVEYANCE OF INFECTION,

WITH A NOTE ON THE CONTACT INFECTION OF CHICKEN-POX.

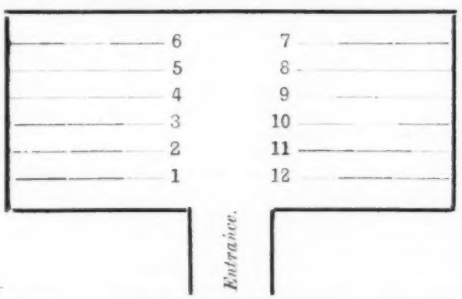
BY FREDERIC H. THOMSON, M.B., C.M. ABERD., D.P.H.,

MEDICAL SUPERINTENDENT OF THE NORTH-EASTERN HOSPITAL, TOTTENHAM, N.

IN an article published in THE LANCET of June 13th, 1914 (p. 1669), Mr. Clifford Price and I recorded two years' work on the aerial conveyance of infection in certain fevers. This work has been continued with increasing difficulty since the outbreak of war until Sept. 29th, 1915, when it had to be stopped owing to shortage in the type of nursing staff, capable of the high standard necessitated, who could be spared for the work. Shortly after the outbreak of war Mr. Price was required for more important duties elsewhere, and I wish to record how deeply I am indebted to him for undertaking this work and sharing the heavy responsibilities with me.

Since a continuation of the investigation has of necessity to be postponed, it seems a fitting opportunity to record the whole of the statistics from the commencement, while avoiding unnecessary repetition of the original article. Once more I wish to express my great appreciation of the work of the nurses, and particularly of Sister Helen Turner, who continued in charge of the ward until it was closed.

For a clear understanding of the position of the patients in the ward the following plan showing the disposition of the beds is necessary:—



The space allotted to each patient is 195 square feet floor space and 15 lineal feet wall space. Commencing Feb. 12th, 1912, 497 patients were treated during a period of three years and somewhat over seven months. As a number of these patients suffered from more than one disease, the number of individual diseases is necessarily more, and amounted to 657.

TABLE I.—*Showing the Number of Patients Treated, and the Diseases from which they Suffered.*

Scarlet fever (with 9 septic cases)	137	Scarlet fever and whooping-cough	18
Scarlet fever and diphtheria (1 septic scarlet fever case)	8	Scarlet fever and varicella (1 septic scarlet fever case)	38
Scarlet fever and diphtheria and varicella	3	Scarlet fever and mumps	8
Scarlet fever and diphtheria and vaginal discharge	1	Scarlet fever and Incipient measles	1
Scarlet fever and diphtheria and whooping cough	1	Scarlet fever and varicella and tinea tonsurans	2
Scarlet fever and diphtheria and mumps	2	Scarlet fever and vaginal discharge	6
Scarlet fever and whooping-cough and varicella	3	Scarlet fever and rubella	26
Scarlet fever and rubella and tinea tonsurans	1	Scarlet fever and rubella and Vincent's angina	1
		Diphtheria	71

TABLE I. *(Continued).*

Diphtheria and whooping-cough	5	Tonsillitis and varicella	1
Diphtheria and mumps	6	Scabies	2
Diphtheria and varicella	4	Pneumonia	2
Diphtheria and rubella	1	Erysipelas	1
Diphtheria and Vincent's angina	1	Tonsillitis	19
Diphtheria and vaginal discharge	1	Mastoiditis	1
Whooping-cough	41	Faucitis	7
Whooping-cough and varicella	2	Pyrexia	2
Whooping-cough and rubella	1	Erythema simplex	7
Whooping-cough and mumps	4	Conjunctivitis	1
Varicella	9	Laryngitis (non diphtheritic)	1
Varicella and mumps	1	Urticaria	1
Mumps	2	Burns	2
Rubella	11	Vaginal discharge	1
Incipient measles	1	No obvious disease	32
		Total	497

TABLE II.—*Showing (separating out the Combined Diseases) the Number of Cases of each Individual Disease.*

Scarlet fever	256	Pneumonia	2
Diphtheria	104	Erysipelas	1
Varicella (including 9 secondary cases left in ward)	63	Tonsillitis	20
Whooping-cough (including 2 secondary cases left in ward)	75	Mastoiditis	1
Mumps	23	Faucitis	7
Incipient measles	2	Pyrexia	2
Rubella	41	Erythema simplex	7
Vincent's angina	2	Conjunctivitis	1
Scabies	2	Urticaria	1
Vaginal discharge	9	Burns	2
Tinea tonsurans	3	No obvious disease	32
Laryngitis (non-diphtheritic)	1	Total	657

TABLE III.—*Days' Stay in Ward.*

Number of patients	497
Aggregate number of days spent in ward	13,148
Average number of days spent in the ward by each patient	26·31

TABLE IV.—*Age-periods.*

	Males.	Females.
Under 1 year	6	6
1-2 years	19	24
2-3 ,,	37	33
3-4 ,,	28	35
4-5 ,,	34	37
5-10 ,,	90	134
10-15 ,,	3	10
15-20 ,,	1	—
Total	218	279
	497	

TABLE V.—*Showing the Day of Disease on which Cases were Admitted to the Ward.*

Disease.	First day.	Second day.	Third day.	Fourth day.	Fifth day.	Sixth day.	Seventh day.	Second week.	Third week.	Fourth week.	Over 4 weeks.	Total.
Scarlet fever	8*	21†	53‡	41	10	8	5	14	19	13	64	256
Diphtheria	—	4	7	18	6	4	12	19	10	3	21	104
Whooping-cough	4§	4	4	9	7	—	6	19	9	1	12	75
Varicella	12¶	4	31	7	2	3	1	3	—	—	—	63
Rubella	32	6	—	2	—	—	—	1	—	—	—	41
Mumps	16	3	2	1	1	—	—	—	—	—	—	23
Measles	2	—	—	—	—	—	—	—	—	—	—	2
Total	74	42	97	78	26	15	24	56	38	17	97	564

* 1 septic. † 3 septic. ‡ 4 septic. § 3 septic. ¶ 2 infected in ward. ¶ 9 infected in ward.

Secondary Infections.

All secondary infections that arose in the ward are called attention to below.

1. *Scarlet fever.*—256 cases of scarlet fever, including 11 septic cases, were treated in the ward, and, in addition, 2 cases which were infected in the ward. Of these 256 cases, 146 were admitted during the first week of the disease, and 110 at a later period. One case of secondary infection occurred on Dec. 24th, 1913, the other on the

following day, and both were left in the ward. As suggested in the former article, the more likely mode of infection was the inadvertent admission of a nurse to duty in the ward who was suffering from a septic finger, and who consequently was unable to wash her hands thoroughly. It is well, however, to record one doubtful secondary infection in January, 1915. This was a case of diphtheria and whooping-cough which developed a rash resembling scarlet fever, but I regarded the rash as being the result of the serum treatment for diphtheria. I admit the case may have been one of scarlet fever, and that I erred in my diagnosis, but the balance of the evidence was in accord with my conclusion.

2. *Diphtheria.*—104 cases were treated. Of these, 51 were admitted during the first week of the disease and 53 at a later period. No secondary cases occurred.

3. *Rubella.*—41 cases of rubella were treated. Of these, 32 were admitted on the first day of the disease, 6 on the second day, 2 on the fourth day, and 1 on or about the eighth day. No secondary cases occurred.

Several scarlet fever convalescents who had been exposed to rubella in other wards were admitted on the chance that they might develop the disease and so help to show if aerial conveyance would take place before the advent of the eruption. None of these developed rubella. Two of the nursing staff of the ward contracted the disease. The first had the rash on April 10th, 1915, and she was on duty in the ward on April 8th. The second developed the rash on April 13th, 1915, and she was on duty up to 8 A.M. on the 12th and not afterwards. No infection arose from these contact exposures.

On one occasion an opportunity arose of placing two first-day cases of rubella into the ward at the same time and advantage was taken of it. On another occasion a first-day case and a second-day case were placed in the ward at the same time.

4. *Mumps.*—23 cases of mumps were treated. Of these, 16 were admitted on the first day of the disease, 3 on the second day, 2 on the third day, 1 on the fourth day, and 1 on the fifth day. On two separate occasions two first-day cases were admitted at the same time, but no infection resulted from these double introductions. One infection of mumps arose and the infected patient occupied Bed 7. There were two possible sources of infection. One patient admitted on the first day of the disease occupied Bed 2, and another admitted on the third day occupied Bed 9. Counting from the first day of exposure the incubation period in the former case would have been 35 days and the latter 15 days. If infection was aerially conveyed I favour the former source. I am doubtful, however, whether this infection may not have been due to some fault in the nursing technique.

5. *Whooping-cough.*—75 cases were treated, including 2 infected in the ward. Of these, 34 were admitted during the first week of the disease, including the two infected in the ward; 19 were admitted in the second week and the remainder at a later period of the disease. Five cases of infection occurred, all of which are described in the original article. Since July 15th, 1913, there has been no whooping-cough infection, although 48 cases have been treated since that date.

6. *Measles.*—No case of measles was knowingly admitted to the ward, but 2 cases admitted with other diseases were incubating measles. Both were productive of secondary cases, as described in the original article.

7. *Chicken-pox.*—63 cases were treated, including 9 infected in the ward. Of the 54 cases introduced, 3 were admitted on the first day of the disease; 4 on the second day; 31 on the third day; 7 on the fourth day; 2 on the fifth day; 3 on the sixth day; 1 on the seventh day; 2 on the eighth day; and 1 on the tenth day. The 3 cases admitted on the first day of the disease all had fresh crops of lesions afterwards and 1 was an infecting case. This case had fresh crops of lesions until the fourth day and infected two patients. The 4 cases admitted on the second day had fresh crops of lesions in two instances, one a copious crop. Three of these infected one patient each; the 2 with fresh crops after admission and one of the others. Of the 31 cases admitted on the third day 4 had a fresh crop of lesions next day, 2 of which were copious crops; 1 of the cases with a copious crop was in Bed 6 and infected the occupant of Bed 8. The other three cases did not cause infection. Of the remaining 27, 2 proved to be infecting cases, and will be described below.

A few of the earlier cases of chicken-pox received "special nursing," which meant that the senior nurse on day or night duty was detailed off to look after the chicken-pox case, and was not allowed to touch any other patient except protected ones, and no other nurse was allowed to touch the chicken-pox patient or anything connected with him.

The 12th case was the last to receive "special nursing," therefore none of the undermentioned cases were so nursed.

19th case.—Bed 1: Third day; fresh vesicles on day of admission, but no fresh lesions in ward. Eleven other cases in ward; 4 protected, 7 unprotected. No infection.

20th case.—Bed 1: Tenth day; scabs only. Six other cases in ward; 3 protected, 3 unprotected. No infection.

21st case.—Bed 1: Third day; fresh vesicles on day of admission, but no fresh lesions in ward. Eleven other cases in ward; 5 protected, 5 unprotected, 1 doubtful. No infection.

22nd case.—Bed 1: Third day; fresh vesicles on day of admission, but no fresh lesions in ward. Eleven other cases in ward: 6 protected, 5 unprotected. No infection.

23rd case.—Bed 1: Third day; pustules but no fresh lesions in ward. Nine other cases in ward; 3 protected, 6 unprotected. No infection.

24th case.—Bed 1: Third day; fresh vesicles on day of admission and fresh crop day after admission. Nine other cases in ward; 5 protected, 4 unprotected. No infection.

25th case.—Bed 1: Second day; vesicles few in number on admission and a fresh and copious crop day after admission. Ten other cases in ward; 6 protected, 4 unprotected. Infected the occupant of Bed 11, who had been removed to another ward.

26th case.—Bed 1: Second day; vesicles but no fresh lesions in ward. Nine other cases in ward; 4 protected, 5 unprotected. Infected the occupant of Bed 6, who had been transferred to another ward.

27th case.—Bed 1: Third day; vesicles but no fresh lesions in ward. Eleven other cases in ward; 3 protected, 7 unprotected, 1 doubtful. No infection.

28th case.—Bed 1: Fourth day; scabs only, no fresh lesions in ward. Eight other cases in ward; 4 protected, 3 unprotected, 1 doubtful. No infection.

29th case.—Bed 1: Third day; vesicles but no fresh lesions in ward. Eight other cases in ward; 4 protected, 4 unprotected. No infection.

30th case.—Bed 1: Third day; vesicles but no fresh lesions in ward. Nine other cases in ward; 5 protected, 4 unprotected. No infection.

31st case.—Bed 1: Third day; vesicles but no fresh lesions in ward. Nine other cases in ward; 5 protected, 4 unprotected. No infection.

32nd case.—Bed 1: Third day; vesicles but no fresh lesions in ward. Eleven other cases in ward; 7 protected, 4 unprotected. No infection.

33rd case.—Bed 2: Third day; vesicles but no fresh lesions in ward. Eleven other cases in ward; 7 protected, 4 unprotected. No infection.

34th case.—Bed 1; Third day; pustules but no fresh lesions in ward. Eleven other cases in ward; 5 protected, 6 unprotected. No infection.

35th case.—Bed 1: Third day; vesicles but no fresh lesions in ward. Eight other cases in ward; 4 protected, 4 unprotected. No infection.

36th case.—Bed 2: Third day; fresh vesicles on day of admission and a fresh and copious crop after admission. Eight other cases in ward; 4 protected, 4 unprotected. No infection.

37th case.—Bed 3: Third day; vesicles but no fresh lesions in ward. Nine other cases in ward; 4 protected, 5 unprotected. No infection.

38th case.—Bed 1: Third day; vesicles but no fresh lesions in ward. Ten other cases in ward; 2 protected, 8 unprotected. No infection.

39th case.—Bed 3: Third day; vesicles but no fresh lesions in ward. Eleven other cases in ward; 5 protected, 6 unprotected. No infection.

40th case.—Bed 8: Third day; vesicles but no fresh lesions in ward. Eleven other cases in ward; 5 protected, 6 unprotected. Infected the occupant of Bed 7, who had been transferred out of ward.

41st case.—Bed 3: Third day; vesicles but no fresh lesions in ward. Eleven other cases in ward; 3 protected, 8 unprotected. No infection.

42nd case.—Bed 10: Third day; vesicles but no fresh lesions in ward. Eleven other patients in ward; 2 protected, 9 unprotected. No infection.

43rd case.—Bed 6: Sixth day; scabs but no fresh lesions in ward. Nine other cases in ward; 2 protected, 7 unprotected. No infection.

44th case.—Bed 8: Eighth day; scabs but no fresh lesions in ward. Nine other cases in ward; 2 protected, 7 unprotected. No infection.

45th case.—Bed 5: Third day; vesicles but no fresh lesions in ward. Eleven other cases in ward; 2 protected, 9 unprotected. Infected the occupant of Bed 8 who was left in ward, and in turn infected the occupants of Beds 6 and 9. No further infections.

46th case.—Bed 7: Third day; vesicles, fresh crop on day of admission but not in ward. Eleven other cases in ward; 4 protected, 7 unprotected. No infection.

47th case.—Bed 10: Third day; vesicles, fresh crop on day of admission but not in ward. Eleven other cases in ward; 4 protected, 7 unprotected. No infection.

48th case.—Bed 4: Third day; vesicles but no fresh lesions in ward. Ten other cases in ward; 5 protected, 5 unprotected. No infection.

49th case.—Bed 4: Eighth day; scabs but no fresh lesions in ward. Eight other cases in ward; 5 protected, 3 unprotected. No infection.

50th case.—Bed 9: Fourth day; vesicles but no fresh lesions in ward. Six other cases in ward; 2 protected, 4 unprotected. No infection.

51st case.—Bed 1: Third day; vesicles, fresh crop on day of admission but not in ward. Eight other cases in ward; 4 protected, 4 unprotected. No infection.

52nd case.—Bed 6: Third day; vesicles, copious crop the day after admission to ward. Eleven other cases in ward; 3 protected, 7 unprotected, 1 doubtful. Infected occupant of Bed 8, who had been transferred to another ward.

53rd case.—Bed 1: Third day; vesicles, fresh crop on day of admission but not in ward. Nine other cases in ward; 2 protected, 4 unprotected, 3 doubtful. No infection.

54th case.—Bed 1: Third day; vesicles, fresh crop on day of admission but not in ward. Nine other cases in ward; 2 protected, 4 unprotected, 3 doubtful. No infection.

As stated above, 3 out of the 31 third-day cases each caused one infection. The first (Case 40) was in Bed 8 and infected the occupant of Bed 7. The second (Case 45) was in Bed 5 and infected the occupant of Bed 8. The third (Case 52) was in Bed 6 and infected the occupant of Bed 8.

Case 40 was the twenty-first case of the series introduced on the third day of the eruption, and the first 19 of the series were each placed next to a protected case or between two protected cases. Case 39 was placed between a protected and an unprotected case, and Case 40 between two unprotected cases, and although 39 failed to infect, 40 did. The bringing nearer to infection of the unprotected cases may reasonably be considered to add to the danger. This course was persisted in until the ward closed, with the result that 6 cases of chicken-pox had each been placed between unprotected cases; 5 next unprotected cases on one side only, and 1 between an unprotected and a doubtfully protected case. The only infection was the one recorded above.

The next third-day infecting case (Case 45) I cannot satisfactorily account for. This patient, who occupied Bed 5, was placed between two unprotected cases and did not infect either of them, but did infect the occupant of Bed 8, directly on the opposite side of the ward. It is to be noted that the occupant of Bed 6 escaped infection from Case 45; he was left in the ward as well as the occupant of Bed 8, from whom he contracted chicken-pox. Case 45 was not a patient from whom to expect infection, for the total number of lesions was quite moderate and there were no fresh lesions on the day of admission or later, the second crop having occurred on the day prior to admission to the ward. It may be that the occupant of Bed 8 was a peculiarly susceptible child, and that the occupant of Bed 6 could withstand infection to some extent, but responded to a more powerful infection. On the whole, however, I think that the occupant of Bed 8 was probably infected by indirect contact due to some error in the nursing technique. I am the more disposed to take this view, knowing the difficulty of maintaining the nursing at the highest level at that time.

The last third-day infecting case (Case 52) might also be attributed to faulty technique, but I do not feel satisfied that such an explanation is justifiable, though the possibility must be admitted. This patient was in Bed 6 and infected the occupant of Bed 8, not quite directly opposite, but failed to infect an unprotected child in the bed next to him. Case 52 had a large crop of fresh lesions on the day following admission to the ward, which may very well account for the infection. On the other hand, it must be remembered that three other third-day cases had fresh crops of lesions on the day following admission (one of them a large crop), without causing infection. Up to, and including, Case 31, only one third-day case of chicken-pox was introduced into the ward at the same time. It was then thought desirable to introduce two third-day cases at the same time if they could be procured. This was done with Cases 32 and 33, and they were placed in Beds 1 and 2; and the same course was adopted with Cases 35 and 36, also in Beds 1 and 2. Finally it was done with Cases 46 and 47, who were put into Beds 7 and 10. In this instance two unprotected cases lay between 46 and 47, and another unprotected patient next to 47 on his other side. No infection arose from these three double exposures.

Comparatively early in the investigation, having introduced a number of third-day cases without infection having arisen, I thought that the second-day case, early in the series, which had produced infection, might have been exceptional, or possibly due to some error in technique. Therefore, I introduced Cases 25 and 26 on the second day of the eruption. However, both of these caused infection. I subsequently commenced introducing cases early on the third day of the eruption, and a number of these passed through the ward. Until Case 40 (the twenty-first third-day case) caused infection the apparent abrupt stoppage of the conveyance of infection by air was a matter of wonder to me, and could hardly be expected to be constant. Yet it appears to hold good that it is unusual under the conditions in this ward for infection to be airborne, even from cases introduced early on the third day. It is interesting to note the distances in the ward that the infection of chicken-pox was aerially conveyed. In all, 15 infections arose. On two occasions the infection was conveyed the whole length of the ward, on three occasions about half the length of the ward, and in the remaining ten the distance was short. The long- and medium-distance infections originated from four first-day cases and a second-day case, and the latter accounted for one of the long-distance infections.

It must be understood that deductions as to the aerial conveyance of infection do not apply to any other conditions than those obtaining in this special ward, for the results might be different were the beds closer to each other, the ventilation less good, &c. I have come to the conclusion that scarlet fever infection is not conveyed by air. It has been

held for many years that the infection of diphtheria is not air-borne, and the evidence in this ward only makes it clearer that this opinion is correct.

I am disposed to regard the evidence as strong against the conveyance of rubella infection by air. A considerable number of the cases of rubella introduced into the ward during the winter of 1914–1915 came from two scarlet fever wards into which the infection had come from outside the hospital, and in these two wards the infection persisted for many weeks although new patients were not admitted. Such persistence of infection in this disease is uncommon, and therefore indicated unusual activity.

I was surprised when an infection arose from mumps (if the infection was aerially conveyed), and I still incline to the view that this disease is probably not air-borne.

The last infection of whooping-cough occurred on July 15th, 1913, although since that time 48 cases have been treated in the ward. Nevertheless I confess I am still in doubt as to whether this disease may be occasionally air-borne or not, Taking into consideration the propelling power of the cough, I feel that longer experience is necessary before a reliable conclusion can be reached.

I am quite satisfied that chicken-pox infection is air-borne early in the disease, but it is difficult to determine the exact time it ceases to be so. It may uncommonly be conveyed by air on the third day, but apparently not afterwards.

A Note on Contact Infection in Chicken-pox.

Although it is safe to treat chicken-pox at certain stages of the disease in this special ward with all its precautions against direct and indirect contact infection, it does not follow that it would be safe to treat it in a similar, or even scabbing, stage in an ordinary ward where no such precautions were taken. It is commonly held that chicken-pox remains infectious until the last scab has separated from the patient's skin. For many years I have been unable to accept that view, and I have often placed patients who were approaching the completion of the scabbing stage into wards amongst children who were not suffering from chicken-pox. With the intention of working this subject out systematically I decided towards the end of 1914 to introduce cases of scarlet fever and chicken-pox into a small boys' scarlet fever ward, but not to guard against contact infection in any way. I purposely chose a ward in which the patients were young, and the ages of the unprotected exposed to the cases of chicken-pox were—one year, 1; two years, 5; three years, 8; four years, 13; five years, 12; six years, 15; seven years, 2; and eight years, 5. As it was necessary that the patient introduced should be a male suffering from both scarlet fever and chicken-pox, and that no other patients should be admitted to the ward while each test was in progress, &c., the work was necessarily slow. In all, 7 patients suffering from both diseases passed through the ward; 1 being introduced on the sixteenth day of chicken-pox; 1 on the twelfth day; 1 on the eleventh day; 1 on the tenth day; 2 on the ninth day; and 1 on the eighth day. Only one case was introduced at a time, and was kept in the ward until all the scabs had separated, or longer; while no patient was discharged until more than 22 days had elapsed after the first exposure, many being kept much longer. No infection arose from any of these cases. The ward in which this work was done accommodated 20 patients.

1st case.—Sixteenth day of chicken-pox; numerous scabs. Nineteen other patients in ward: 12 protected, 5 unprotected, 2 doubtful. No infection.

2nd case.—Eleventh day; a few scabs. Eighteen other cases in ward: 12 protected, 5 unprotected, 1 doubtful. No infection.

3rd case.—Tenth day; moderate number of scabs. Nineteen other cases in ward: 5 protected, 12 unprotected, 2 doubtful. No infection.

4th case.—Ninth day; scabs fairly numerous. Eighteen other cases in ward: 9 protected, 7 unprotected, 2 doubtful. No infection.

5th case.—Twelfth day; scabs fairly numerous. Nineteen other cases in ward: 10 protected, 9 unprotected. No infection.

6th case.—Ninth day; scabs very numerous. Eighteen other cases in ward: 9 protected, 8 unprotected, 1 doubtful. No infection.

7th case.—Eighth day; moderate number of scabs. Nineteen other cases in ward: 4 protected, 15 unprotected. No infection.

Although only seven cases of chicken-pox in the scabbing stage have passed through the ward as yet, it is sufficient to show that I was justified in my disbelief of the generally accepted view. While it is interesting that the last case was introduced as early as the eighth day, yet it will probably take a considerable time to discover the exact day of the disease on which the chicken-pox patient ceases to be a danger to those with whom he comes in contact. Nevertheless, enough has been done to lead to economy in the provision of isolation accommodation for this disease in hospitals, and to show that it is needless to keep the chicken-pox patient separate from others for so long as is generally supposed necessary.

North-Eastern Hospital, Tottenham, N.

THE UREA CONTENT OF THE CEREBRO-SPINAL FLUID:

WITH SPECIAL REFERENCE TO THE DIAGNOSIS OF URÆMIA.

BY R. G. CANTI, M.A., M.B. CANTAB.,

DEMONSTRATOR OF PATHOLOGY, ST. BARTHOLOMEW'S HOSPITAL; PATHOLOGIST TO THE ALEXANDRA HOSPITAL, QUEEN SQUARE.

IN recent years a considerable amount of work has been carried out, chiefly by French observers, on the urea content of the cerebro-spinal fluid. Mestrezat, who has collected the data of Javal, Dirksen, Widal, Froin, Froment, and many others, and who has made many additional observations, has come to the following conclusions: 1. The normal physiological urea content of the cerebro-spinal fluid is 0·006 per cent. 2. Cases of renal impermeability to urea without uræmia may show up to 0·1 per cent. of urea, and occasionally individuals may have a larger quantity without showing clinical signs. 3. Cases of clinical uræmia in which no other disease is present (i.e., "pure uræmia") have been found to have 0·098 to 0·634 per cent., and of these cases those with readings below 0·3 per cent. are curable and those with readings above 0·3 per cent. are fatal. (Mollard and Froment, to whom the terms "pure" and "associated" are attributable, choose 0·4 per cent. as the dividing line.) 4. Cases of clinical uræmia in which some other disease is present (i.e., "associated uræmia") have been found to show 0·1 to 0·764 per cent. of urea. 5. The content of urea present in the cerebro-spinal fluid, whether it be normal or raised, is approximately the same as in the blood.

In determining the figures given below the following methods of collection and determination have been adopted:—

1. *Collection of cerebro-spinal fluid.*—Ante-mortem: Lumbar puncture has invariably been employed. Post mortem: Lumbar puncture has occasionally been employed, but often sufficient fluid has only been obtained with difficulty. It has been found that a greater amount could be obtained by one of the following methods. (*a*) Puncture of the occipito-atlantoid ligament, with or without a skin incision, and drainage of the cerebro-spinal fluid from the sub-cerebellar cisterna. This method of gaining entrance has been described by Dixon and Halliburton, and has been used by Gordon in experiments on monkeys. (*b*) When the brain has been removed a No. 6 gum-elastic catheter is introduced down the spinal canal in front of the cord, and the fluid withdrawn by means of a syringe.

2. *Method of determination.*—The hypobromite method has been employed. 5 c.c. of the cerebro-spinal fluid, centrifugalised if turbid, was mixed with the sodium hypobromite solution (25 c.c. of 40 per cent. potassium hydrate solution in which an ampoule containing 2·2 c.c. of bromine had been broken, and the solution allowed to cool) and the gas given off was measured as percentages of urea. The apparatus was essentially that of a Gerrard's ureometer except that the measuring tube was much narrower (about 12 mm.) in order that 0·01 per cent. could be read with accuracy. Care was taken that the temperature in the mixing bottle was the same at the beginning and end of each experiment, but no allowance was made for small variations caused by alterations in temperature and pressure between separate experiments. Chemically the reaction is complicated, and the quantity of gas given off is influenced by nitrogenous substances other than urea. In blood serum these substances exist in large amount, but in the cerebro-spinal fluid they are to a great extent absent.

Most of the estimations were performed post mortem. In nine cases they were performed both post mortem and ante mortem, and it was found that the difference between them varied from 0·01 to 0·10 per cent., the average post-mortem reading being 0·06 higher. The results may be collected into the following six groups.

Group A: Normal Urea Content.

Owing to the difficulty of obtaining cerebro-spinal fluid from perfectly normal individuals no figures have been obtained to determine the urea percentage. Seven cases, however, being all the cases examined ante mortem, in which there was reason to believe that the kidneys were natural or not materially damaged, show figures which should be comparable with the normal. The amounts of urea vary from 0·02 to 0·05 per cent.

Group B (vide *Table I.*).

The urea content in cases clinically diagnosed as or suspected of being uræmia in which the reading was above 0·10 per cent. ante mortem or 0·16 per cent. post mortem. (This latter figure is chosen because, as has already been pointed out, the post-mortem reading is on the average raised by 0·06.)

Of the 20 cases, 19 were diagnosed as uræmia and one (No. 2) was a suspected case. Of those diagnosed, 13 correspond to the "pure uræmia" of Mollard and Froment, and have urea readings between 0·23 and 0·88 per cent.; 6 had some complicating disease and correspond to the "associated uræmia" group. In these the percentage of urea varied from 0·26 to 0·51 per cent. The age incidence of the majority of the patients was that of the first half of life. No. 114 is the only case of acute nephritis examined. The patient died on the twenty-ninth day after the commencement of scarlet fever. As regards the blood pressure, the average of all the readings obtainable (occasionally more than once from the same patient) was 160 mm. of mercury, and the average weight of the heart in adults was 15 oz.

TABLE I.

No. of case.	Sex and age.	Associated disease, if any.	Blood pressure (mm. Hg).	Albumin in urine (per cent.).	Weight of heart (ounces).	Urea percentage—	
						Ante mortem	Post mortem
1	M., 39	—	260, 150	0·3	16	—	0·40
2	M., 65	Cerebral hæmorrhage.	240	0·025	22	0·16	0·20
4	F., 27	Malignant endocarditis.	—	+	15	0·50	0·51
20	M., *c.* 20	—	—	?	14	—	0·42
23	F., 36	—	130	0·24	12	0·43	0·53
27	F., 47	—	220	++	13	—	0·65
48	M., 29	—	150	0·15	10	—	0·88
50	F., 39	—	215, 180	++	19	0·65	0·73
53	M., 25	Peritonitis.	—	0·4	15	—	0·26
59	M., 42	—	180, 150	0·05	18	—	0·23
75	F., 40	—	220	0·3	19	—	0·41
83	M., 53	Double pyonephrosis.	112	?	13	0·39	0·43
84	M., 41	—	220	0·4	13	—	0·45
93	M., 46	—	150	0·18	(No necropsy)	0·72	(No necropsy)
94	F., 50	—	146	++	?	—	0·77
96	M., 34	—	150	++	(No necropsy)	0·45	(No necropsy)
104	F., 25	Pyonephrosis.	—	+	9	—	0·44
105	M., 33	Tuberculous kidneys.		++	12	0·39	0·40
109	F., 40	Syphilitic endarteritis.	—	++	24	—	0·36
114	M., 5	—	—	0·25	?	—	0·41

In the majority of the 19 cases there was a large quantity of albumin present in the urine. The remaining case, No. 2, was that of a man of old age who had a high blood pressure, a hypertrophied heart, and but little albumin in the urine. Post-mortem examination revealed a hæmorrhage in the right optic thalamus which was undoubtedly the direct cause of death.

Group C (vide *Table II.*).

The urea content in cases clinically diagnosed as or suspected of being uræmia in which the reading was below 0·10 or 0·16 per cent. post mortem.

Firstly, those in which the diagnosis was entirely mistaken—viz., Nos. 35 and 92.

Secondly, cases of chronic nephritis.

(*a*) *Non-fatal cases* (Nos. 86, 89, and 98).—The patients suffered from various combinations of the following signs and symptoms: headache, vomiting, dyspnœa, œdema, diminution of urine, albuminuria, and albuminuric retinitis. Twitchings, fits, drowsiness, and coma were absent. They all three were discharged from hospital in an improved condition, and one case, who had 0·43 per cent. of albumin in the urine and marked albuminuric retinitis, was known to have remained in fairly good health for at least six months.

(*b*) *Fatal cases* (Nos. 33, 52, and 71).—Coma was the prominent sign in the first, and fits were present in the remaining two. In all three cases cerebral lesions were found on post-mortem examination.

CASE 71.—The patient, a woman, aged 22, had suffered from headache and vomiting at intervals for 18 months; shortly before admission she noticed swelling of the ankles and face. On examination no œdema was found, she had headache, vomiting, albuminuric retinitis, and much albumin in the urine, which was diminished in quantity. She improved under treatment, and the urine increased to physiological amounts. After a month she was able to get up. She then developed a left-side facial palsy, with pain and deafness in that ear. One evening shortly after she had gone to bed she was found with twitching of the arms and face in an unconscious condition, from which she never completely recovered. On post-mortem examination a ruptured aneurysm was found on the anterior communicating artery, giving rise to a subdural hæmorrhage over the right hemisphere.

Thirdly, cases of cardio-vascular disease (arterio-capillary fibrosis of Gull and Sutton)—viz., Nos. 90, 95, and 97. With regard to the diagnosis of uræmia in cases of this kind and in those with various forms of nephritis proper, a considerable amount of work has been performed at St. Bartholomew's Hospital, but has not yet been published. The inquiries deal with the clinical diagnosis, the histology of the

TABLE II.

No. of case.	Sex and age.	Disease.	Blood pressure (mm. Hg).	Albumin in urine (per cent.).	Weight of heart (ounces).	Urea percentage— Ante mortem.	Urea percentage— Post mortem.	Remarks.
35	M., 23	Peritonitis	100	++	7	—	0·10	
92	F., 30	Obscure anæmia	?	Trace	—	0·03	—	Discharged
86	M., 38	Chronic nephritis	140	0·10	—	0·05	—	Discharged improved.
88	F., 26	,,	184-240	0·43	—	0·05	—	,,
98	F., 23	,,	120-160	0·5	—	0·05	—	,,
33	M., 37	Chronic nephritis Syphilitic pachymeningitis	180	++	22	—	0·15	
52	F., 35	Chronic nephritis Cerebral softening	210	++	17	—	0·09	
71	F., 22	Chronic nephritis Cerebral hæmorrhage	230	++	13	0·07	0·15	
90	M., 53	Cardio-vascular disease	220-180	Trace	—	0·01	—	Discharged improved.
96	M., 61	,,	260-120	0·025	—	0·05, 0·06	—	,,
97	M., 38	,,	220-190	0·25	—	0·02	—	,,

kidneys, the tests for renal insufficiency, the condition of the fundus oculi, and the variations of the carbon-dioxide content of the alveolar air, and though it is beyond the province of this paper to enter into details, yet it may be said that there is a general convergence of opinion that the two conditions are widely different, the one which we are now considering being due to the failing action of the heart beaten by its task. Of the cases examined all responded to means taken to ensure more efficient action of the heart and were discharged in a greatly improved condition. The maximum blood pressure which these patients show, when not suffering from cardiac inefficiency, is seen to be over 200 mm. of mercury.

CASE 95.—The patient, a man aged 61, had been suffering with headaches for the past few years, which were throbbing in character. He had had no giddiness, nocturnal micturition, or shortness of breath. On admission on Oct. 25th, 1914, the heart was hypertrophied but with no valvular disease, the temporal and radial arteries were tortuous; the blood pressure was 260 mm. of mercury. The urine was diminished and contained 0·025 per cent. of albumin. On Nov. 13th his blood pressure was 220 mm. of mercury, and on the 17th he began to be drowsy. On the 18th he was given a hot-air bath, phlebotomy was performed, 8 ounces of blood were withdrawn, and 1½ pints of physiological saline solution injected, and he was fed through the nose. On the 19th he was almost unconscious, the blood pressure was found to be 135 mm. of mercury, and lumbar puncture was performed and the urea estimated and found to be 0·05 per cent. He was then given 0·0005 grm. of digitalin, and ordered a mixture of strychnine and digitalis. The next morning he was somewhat better though still semi-conscious, but in the afternoon he roused himself suddenly and asked for a cup of tea. From that day his blood pressure gradually rose and he began to get better. He was discharged about a fortnight later in a much improved condition with a blood pressure of 190 mm. of mercury.

Table III. shows a comparison of the more important signs and symptoms usually found in the two groups of cases. In Column 1 are placed the conditions some or all of which are found in cases

TABLE III.

—	1. Uræmia.	2. Cardio-vascular disease.	2A. Cardio-vascular disease when heart failure occurs.
Age	Up to 45.	Above 45.	...
Sex	Equal proportions.	More often males.	...
Headache	+	+	+
Vomiting	+	+	+
Twitching	+	—	+
Dyspnœa	+	—	+
Cyanosis	+	—	+
Delirium	+	—	+
Coma	+	—	+
Œdema	+	—	+
Urine	Diminished.	Increased.	Diminished.
Albumin in urine	Large quantity.	None or trace.	Trace or small quantity.
Changes in fundus oculi	+	+	+
Urea in cerebro-spinal fluid	Much increased.	Normal.	Normal.
Blood pressure	About 160.	About 200.	Fall.
Heart	Slight hypertrophy.	Great hypertrophy.	...
Kidneys	Nephritis type.	Vascular type.	...

clinically diagnosed as being uræmic in which a high urea content is found in the cerebro-spinal fluid. In Column 2 are the corresponding conditions found in cases of cardio-vascular disease in which the patient is suffering from high blood-pressure symptoms, but otherwise is in a fairly good state of health. Column 2A shows the alteration in signs which occur in various degrees of heart failure in the course of cardio-vascular disease. Failure of the left side of the heart is followed by fall in blood pressure, diminution in urine, dyspnœa, cyanosis, delirium and coma, and failure of the right side, should it supervene, by œdema and albumin in the urine. A comparison of the signs and symptoms in Columns 1 and 2A clearly demonstrates how one condition may be mistaken for the other, and at the same time shows the value of a urea estimation for purposes of differential diagnosis.

Group D (vide *Table IV.*).

Urea content in cases not clinically diagnosed as or suspected of being uræmia in which the reading was above 0·10 per cent. ante mortem or 0·16 per cent. post mortem.

It is unnecessary to enter into details of these cases, which would unduly lengthen this paper. It will suffice to say that the condition of the patients was such that any signs of clinical uræmia present were either altogether masked or attributed, rightly or wrongly, to some other cause.

TABLE IV.

No of case.	Sex and age.	Clinical diagnosis.	Urea percentage— Ante mortem.	Post mortem.
9	M., 1½	Delayed chloroform poisoning.	—	0·25
11	F., 63	Cerebral hæmorrhage.	—	0·73
16	F., 35	Chronic nephritis; general peritonitis.	—	0·31
18	F., 8	Acute embolic focal nephritis; malignant endocarditis.	—	0·38
22	M., 66	Pyelonephritis.	—	0·24
24	M., 3	Tuberculous enteritis.	—	0·31
31	M., 44	Old tuberculous hip; amyloid disease; diverticulitis, acute ascending nephritis, &c.	—	0·53
32	M., 39	Malignant endocarditis.	—	0·18
37	M., 2	General tuberculosis.	—	0·19
42	M., 22	Malignant endocarditis.	—	0·25
45	M., 46	Carcinoma ventriculi.	—	0·27
51	F., 1½	Broncho-pneumonia.	—	0·20
64	M., 50	Arterio-sclerosis; cerebral softening.	—	0·26
65	M., 34	Broncho-pneumonia; cerebral embolism.	—	0·22
79	M., 55	Perforated duodenal ulcer.	—	0·23
111	M., 16	Hydatid disease of liver; general tuberculosis.	0·16	0·26

Group E.

Urea content in cases not clinically diagnosed as or suspected of being uræmia in which the urea content was below 0·10 per cent. ante mortem or 0·16 per cent. post mortem.

This series consists of 55 observations on a large variety of cases, which it is unnecessary to enumerate, and demonstrates the absence of urea in the cerebro-spinal fluid in the majority of diseases, even as a terminal event.

Group F.

This group contains the cases of diabetes examined (ten in number). They show a urea content which varies from 0·07 to 0·34 per cent., and they have been placed apart as the reading obtained by the hypobromite method is erroneous. This is shown by the following experiment. A solution of urea in water was estimated for urea. Dextrose was added to a fresh portion of the same solution and the estimation performed again. The second reading was considerably higher than the first, showing that dextrose is at least one of the substances which may cause a high reading in cases of diabetes.

From the foregoing observations it appears that:—

1. The normal physiological urea content of the cerebro-spinal fluid, as measured by the hypobromite method, is below 0·05 per cent.

2. Cases clinically diagnosed as uræmia fall under two headings: (*a*) Those which have a high urea content. All were fatal cases. Thirteen were uncomplicated renal disease. Six were complicated with disease other than renal. The remaining one died from cerebral hæmorrhage. (*b*) Those which have a low urea content. In two the diagnosis was altogether mistaken. In three there was chronic parenchymatous nephritis. They had œdema or vomiting, or both, but no fits were present. They recovered and were discharged in an improved condition. Three more suffered with chronic parenchymatous nephritis. Fits were present in two. They all died and were found to have cerebral lesions. Three had cardio-vascular disease, and cardiac failure was present. They were discharged in an improved condition.

3. Cases not clinically diagnosed as uræmia fall also under two headings: (*a*) Those with a high urea content. They were all cases complicated by disease other than renal, and any signs suggestive of uræmia which may have been present were either masked or attributed to some other cause. (*b*) Those with a low urea content.

The term "uræmia" is used to group together some or all of a set of signs and symptoms occasionally found in pathological conditions of the kidney. It has long been observed that there existed differences between individual cases, which divided "uræmia" into certain types, and it has been proved that excess of urea in the system is not of itself the cause of "uræmia." The term, therefore, is admittedly vague and fallacious, but it seems necessary to retain it, at any rate for the majority of such conditions, as it conveys to the mind a definite group of clinical entities.

The number of cases examined in this paper is too small for statistical purposes, but certain points have been observed which give a clue to the differentiation and a clearer prognosis of the various conditions diagnosed as uræmia.

Firstly, of the cases so diagnosed which die, the majority are found to have a greatly increased quantity of urea in the cerebro-spinal fluid, usually about ten times, and occasionally more than twenty times, the normal amount. For these the term "true uræmia" is suggested. Sometimes an "associated" disease is present, but more often the condition is "pure," in which case the quantity of urea present tends to be somewhat higher. Every case in which a greatly increased quantity of urea has been found in the cerebro-spinal fluid has proved fatal within a short period.

Secondly, a few cases of large or small white kidney have been diagnosed as suffering from uræmia, and little or no excess of urea has been found in the cerebro-spinal fluid. Of this group, those which recovered had no fits, and those which died were found to have cerebral lesions.

Thirdly, a certain number of cases of cardio-vascular disease (arterio-capillary fibrosis) are diagnosed as uræmia. It has been shown that the signs and symptoms suggesting such a diagnosis can be due to cardiac failure; that the patients respond to treatment directed towards restoring the efficiency of the heart, and tolerate badly treatment directed towards overcoming a toxic condition of the blood and tissues; and that there is no excess of urea in the cerebro-spinal fluid. For these cases it seems imperative that the term "uræmia" should no longer be employed. As long ago as 1872 Sir William Gull was contending with the same fallacy when he spoke thus at a clinical lecture at Guy's Hospital: "At the present time there is a dominant idea in respect of chronic Bright's disease with contracted kidney, that the various functional disorders and lesions which occur in its course are chiefly, if not entirely, connected with a *materies morbi* in the blood, to which such disorders and lesions are chiefly referable. ..... The theory that all or most of the symptoms in chronic Bright's disease are due to uræmia is frequently fraught with dangerous and destructive effects in practice. I call vividly to mind the unhappy results of treatment so directed."

The writer is indebted to the members of the staff and to his colleagues in the Pathological Department of St. Bartholomew's Hospital for their kind advice and assistance in enabling him to collect

notes and material, and especially to Dr. Gordon, who originally suggested the research.

The expenses of this work were in part defrayed by a grant from the Government Grant Committee of the Royal Society.

Bibliography.—Gull: Lecture delivered at Guy's Hospital, 1872. Brit. Med. Jour., Dec. 21st, 1872. Widal and Froin: Gazette des Hôpitaux, 1904, p. 1182, or C. R. Société de Biologie, 1904, vol. lvii. Javal et Adler: C. R. Société de Biologie, 1906, p. 237; 1909, vol. lxvi. Mollard and Froment: Journal de Physiologie et de Pathologie Générale, 1909, p. 263. Javal et Adler: C. R. Société de Biologie, 1910, vol. lxviii. Javal: Bull. et Mem. Soc. Med. des Hôpitaux de Paris, 1911, vol. xxxii., p. 627. Widal: Bull. et Mem. Soc. Méd. des Hôpitaux de Paris, 1911, vol. xxxii., p. 485. Mestrezat: Le Liquide Céphalo-rachidien, &c., 1912. Dixon and Halliburton: Journal of Physiology, 1913, p. 215. Cole: Practical Physiological Chemistry, 1914. Soper and Granat: Archives of Internal Medicine, 1914.

Hampstead, N.W.

PROPHYLACTIC VACCINATION AGAINST HAY FEVER.

BY B. P. SORMANI,

LECTURER ON SEROLOGY AT THE UNIVERSITY OF AMSTERDAM.

(*From the Laboratory of the Onze-Lieve-Vrouwe-Gasthuis.*)

IN the hay-fever season of last year I had an opportunity of observing the results of vaccination or active immunisation with extract of pollen in 48 cases. These patients included three whose cases I dealt with in a previous paper.[1]

Noon,[2] who, like Dunbar, considered hay fever a toxic disease, treated the patients before the hay-fever season arrived with the toxin itself by applying an extract of the pollen. Though this is a prophylactic vaccination he yet applied the treatment according to Sir Almroth Wright's rules of therapeutic vaccination. He fixed the quantity of each dose in accordance with the resistance of the patient against the toxin, measuring this quantitatively by the ophthalmo-reaction of Elliotson and proposed to begin with a dose of one-third of the number of units representing the resistance. The succeeding dosage was then settled in accordance with the altered resistance.

After Noon's death Freeman, who continued his work, prepared the extract by a method similar to Noon's—viz., freezing and thawing 40 or 50 times the pollen suspended in water. Then the fluid, which is slightly green, is centrifuged, and sterilised for ten minutes at 100° C. The slight green colour appears about the 30th freezing, as Freeman wrote to me. In this way an extract is made of the whole pollen growth of one year, and is used for diagnosis and treatment before the hay-fever season begins. Freeman[3] commences his treatment generally in October of the preceding year and continues it as long as possible.

The treatment here described I began to apply during the winter of 1913–14 in the three cases already recorded. The results were very favourable and encouraged me to proceed on the same lines, which were in some respects different from the methods of Freeman. Let me explain these differences.

First, I rejected Noon's dosage method. As the treatment is a prophylactic one I did not see why it should be necessary to regulate the dosage as if the disease existed already. Wright's opsono-therapeutic rules were made for existing diseases and they keep in view the possibility that an overdose would for a short time neutralise too many antibodies, in consequence of which the infection might progress undisturbedly. Wright himself, however, gives up this method if there is any question of a prophylactic treatment. I have only to recall his antityphoid inoculation, for which he prescribes the injection of 1000 and 2000 millions of typhoid bacilli with an interval of from 8 to 10 days. Undoubtedly the first dose might cause a negative phase lasting for more than 10 days, and consequently the second dose would become dangerous if this vaccination was not a prophylactic but a therapeutic measure. The prophylactic vaccination for hay fever may be absolutely compared to this antityphoid vaccination, and I think that dosage in cases like this is only to be determined by what the patient is able to support without any trouble. In determining the first dose of 1000 millions of typhoid bacilli Wright probably only considered how many typhoid bacilli a normal man could stand without suffering any serious reaction.

I took this into consideration when regulating the dosage of pollen extract, and I found that everyone can support 10 U.P. as an initial dose without any considerable trouble. When, however, more was given for an initial dose the local reaction was very troublesome owing to the extension of the swelling that followed, sometimes being accompanied by itching over the whole body and sometimes by urticaria. This at the same time condemns Noon's method of dosage. For instance, if the resistance before the treatment is found to be 1500 U.P., I should not dare to give 500 U.P. as an initial dose. Moreover, there was another reason why I refused to follow Noon and Freeman in their dosage, a reason which may be only of theoretical interest, however, because I have never tried to prove it. After treating a patient for hay fever for some weeks or even months we have not only inoculated toxin, but also a great number of other kinds of albumin found in pollen which have nothing to do with the poisonous fraction. If we determine the resistance by ophthalmo-reaction we must agree that allergy may be produced for those other albumins, and who can prove that in this way the resultant figure has not been influenced? I, at any rate, could not accept it as a perfect test. That a hypersensibility for the pollen extract can be originated is well proved by the fact that now and then urticaria is observed during the treatment. There is no reason why this should be caused only by the toxic albumin which causes hay fever.

Accordingly in January, February, or March I began the treatment by administering a dose of 10 U.P., increasing the amount every week as far as possible in each case. Generally I proceeded up to 1000 U.P., but when the patient showed symptoms of an overdose the increase was very slow or not at all.

I altered also the preparation of the extract. I ground the pollen by rubbing it with sterile sand, and made the extract with distilled water. This extract was not boiled, but was sterilised by adding one-tenth of its volume of 5 per cent. carbol solution, after which salt was added up to 0·85 per cent. Of course, carbolic acid was not added to the extract which had to serve for the ophthalmo-reaction, but it was boiled for 10 minutes, as Freeman does.

Finally, it is a well-known fact that the solution of pollen toxin soon loses its antigen power, at least partly. Noon and Freeman were of opinion

[1] Nederl. Tydschr. v. Geneeskunde, Nov. 28th, 1914.
[2] THE LANCET, June 10th, 1911, p. 1572. References were given in the paper already mentioned.
[3] THE LANCET, Sept. 16th, 1911, p. 814; April 25th, 1914, p. 1178.

that they might take for granted that the toxin standard did not diminish, founding their opinion on the fact that the ophthalmo-reaction was obtained as perfectly with old as with new extract. Nevertheless, I think it is better to use only fresh vaccine for inoculations, which is no trouble worth mentioning, as the vaccines made in the simple way described were not less effective than those prepared on Freeman's method.

In each case I first determine the ophthalmo-reaction. In most of my patients I found a resistance of 500 U.P. The reaction is not sharp, at all events, in my opinion, not such as to serve as a guide to treatment. Notwithstanding this I consider it to be of the highest importance to make an examination in the beginning for diagnostic purposes, for in this way I proved that two cases suspected to be hay fever were something else. If in such a case we inoculate against hay fever without previous diagnosis wrong statistics as to the effect of this treatment are obtained. All other patients showed a clear positive reaction. The lowest resistance which I found was 5 U.P., the highest 5000 U.P. Almost all these had been treated in every possible way: the nose had been treated with cautery or scalpel, they had been injected with pollantin and graminol; rhioculin had been used, chalk-therapy was applied, but all without any success.

Before relating the results of the treatment it may be observed that the past hay-fever season, in the opinion of patients not treated prophylactically, was very severe and even more unfavourable than the preceding three years. I saw some very bad cases. The treatment I applied in 1915 was as follows: The initial dosage was always 10 U.P. A little reddening and swelling were observed at the place of injection. The dose was increased every week generally as follows: 20, 30, 40, 50, 70, 90, and then beyond 100 more rapidly—thus: 150, 200, 300, 400, 500, &c. Various circumstances prevented me from beginning before February, but in a few cases it might have been better to have begun earlier. I believe so, but it is rather an unfounded opinion, for a few patients who began in April, and even in May, were perfectly cured.

In the matter of dosage I had proposed to myself to go, when possible, up to a final dose of 1000 U.P., which appeared to me a very high dose. And so it proved to be; for some patients even it was too high, as shown by the resulting symptoms. It also appears that it is often unnecessary to proceed to such a high dose, as some patients were well cured with a much lower final dose than 1000 U.P.

I think it is desirable to proceed to higher dosage only if, during the preceding immunisation, nothing has appeared leading to a suspicion of hypersensibility, such as general itching or symptoms of an attack of hay fever (irritation and swelling in the eyes, a slight attack of asthma for a short time, or anything of that kind). Now and then these symptoms appear, and, of course, are very unpleasant, but I think they are rather difficult to prevent. They are not exclusively to be attributed to an overdose, for in some cases all appeared even with a very small dose. However, I am bound to say that none of the patients or their physicians considered these symptoms sufficiently disagreeable to stop the treatment. Moreover, I may point out that last year I only once discovered slight by-symptoms in one of my 14 patients prophylactically treated, whilst among the 19 patients treated by other physicians six suffered from them. I do not know to what cause this difference is to be attributed. That these by-symptoms are not prevented by Freeman's method of dosage I learned from a letter from my colleague L—— at Z——, in which he cited the case of a patient, who, in 1914, after the first injection of Freeman's vaccine (pollacin), measured on Freeman's method, had a violent attack of asthma in the night.

At the end of May I stopped the treatment, but I always asked the patients to return at once if any symptom of hay fever appeared. If a patient returned I did not then give so high a dose as in May, but decreased it to 50 or 100 U.P. for fear of a negative phase. Soon this fear proved not unfounded, for a patient who during the hay-fever season had been given once 1000 U.P. wrote to me and described what were undoubtedly attacks.

In the hay-fever season itself I had the opportunity of studying the results of therapeutic inoculations in non-prophylactically treated patients. In these cases I began with from 5 to 10 U.P., sometimes making no increase at all and sometimes increasing when it seemed necessary, but then only to 25 or 50. The experience in one case proves that 50 U.P. cannot be given in the hay-fever season to non-prophylactically inoculated patients without bad consequences. The patient who was already completely cured by from 5 to 25 U.P., had a violent attack after increasing the dose to 50 U.P. I consider these facts to be good ground for believing in the existence of a negative phase, although several vaccino-therapeutists doubt this because they have never, or clinically not always clearly, observed it in prophylactic antityphoid vaccinations.

The results of the cases treated during 1915, either by myself or by other doctors after correspondence with me, are as follows:—

1. Of 14 patients I treated prophylactically, 6 were completely cured, 6 felt very little of their former sufferings, whilst 2 considered they had received but little benefit from the treatment.

2. Of 12 patients I treated only phylactically 4 were completely cured, whilst 3 felt more or less relief, and 5 felt no relief at all.

3. Of 19 patients treated prophylactically by other physicians, all found much relief (it is rather difficult to decide from their letters how much or how little), whilst of 3 treated therapeutically all found relief.

This brief summary shows as well as possible the experiences of myself and others. It must be pointed out that it is exceedingly difficult to express in a few words the result of the treatment. Some patients, for instance, are highly enthusiastic about the effect, although I had to note slight attacks from which they suffered after a short railway trip. Very often those slight attacks consist only of irritation in the eyes or slight catarrh which anyone who does not suffer from hay fever would scarcely have noticed, but which, in the patient concerned, take the place of previously unbearable conjunctivitis, asthma, and catarrh of the whole respiratory tract. By these remarks I desire to show that I have been anxious to err, if anything, rather on the side of pessimism in compiling and summarising the results. Consequently there is good reason for considerable satisfaction.

Finally, I would advise a slow increase of dosage; further, to begin as early as possible, and using every time a fresh vaccine; to give only so much as will produce a minimum local reaction. The local reddening should not exceed 5 cm. across.

Moreover, the patient should be asked repeatedly if he has general itching or slight urticaria, or irritation in the eyes. Until we find an animal suitable for experimentation, this therapy will only advance very slowly. The experiences of the method already gained are, however, better than the results of a great many older methods of treatment, and this in itself may be regarded as an acquisition. In this paper I have endeavoured to prove that it is possible to simplify the method of Noon and Freeman so far as to enable the practitioner to apply the vaccine in these cases without fear of obtaining less good results.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF FEBRIS COLOMBENSIS.

BY G. A. LURIE, M.D. CHICAGO,
ATTACHED TO THE AMERICAN RED CROSS SANITARY COMMISSION IN SERBIA.

IT may be of interest to place on record a case of febris colombensis I have recently observed in Serbia. On this fever, which was first described by Castellani in Ceylon in 1905, there is very little literature, the only papers on the subject known to me, apart from Castellani's publications, being one by Fulle and one by Spaar. This fever, as noted by Castellani, sometimes resembles typhoid or paratyphoid; at other times it is more like Malta fever with several relapses. The onset is in most cases slow and gradual, but at times it may be quite abrupt; the general condition of the patient is usually rather severely affected, and a true typhoid state may develop, but very mild cases may also be met with. No roseola or other rashes have been noted, and the spleen is seldom palpable; there may be constipation or diarrhœa. No case so far has ended fatally, but the general condition may be very severe. As regards complications and sequelæ, cystitis has been noted and osteoperiostitis.

The patient, an Austrian, had been prisoner in Serbia since December, 1914. There was nothing worth noting in his past medical history. He never had been in the tropics. At the end of June, 1915, while in Skoplje (Uskub) he began feeling tired and feverish and was seen several times by me, first as an out-patient at the American Clinique and afterwards at the Second Reserve Hospital. The fever was of a subcontinuous type, the temperature seldom exceeding 103° F., and it lasted for five weeks, terminating by lysis. The general condition of the patient never was very severe. No roseola, no enlargement of the spleen, no complication of any kind.

The bacteriological examination of the case was carried out with the kind assistance of Mr. D. de Silva. The blood was examined for agglutination for typhoid, paratyphoid A and paratyphoid B, and Malta fever four times—three times during the course of the fever and once two weeks after the fever was over, always with negative results; while it agglutinated B. colombensis. Ceylon strain (cultures kindly supplied by Professor Aldo Castellani) in dilutions of 1/40, 1/80, and occasionally 1/160. No hæmocultures were carried out, but the stools collected in a large sterile Petri dish were examined bacteriologically in the usual way by plating, &c. B. typhosus and paratyphosus A and B were absent, while 4 colonies out of 26 investigated turned out to be bacillus colombensis, the others being coli and coli-like bacilli.

The strain isolated from this patient is identical to the Ceylon strain and corresponds in every particular to the description given by Castellani. It is a motile bacterium, Gram-negative, does not liquefy either gelatin or serum. On agar the growth may be typhoid-like, or the germ may grow more abundantly than true typhoid. The germ grows well in milk, rendering the medium acid at first, alkaline later, and often bleaching it; at times the medium may become permanently acid. As regards sugar reactions, as stated by Castellani and Spaar, there is no production of gas in saccharose, raffinose, adonite, inulin, inosite, amygdaline, or erythrite, while there is formation of gas in dulcite, mannite, glucose, maltose, dextrin (very slight), arabinose, sorbite, glycerine, isodulcite, galactose, levulose, and salicin.

It is interesting to note the action on lactose. I can completely confirm the previous observation made by Castellani and Spaar, that the same strain may at times produce a little gas in lactose and at other times none, while the colonies of the germ on MacConkey bilesalt-lactose agar are always white, never red.

The peculiar inconstant action of the germ on lactose renders its classification difficult. When it does not ferment lactose, as is often the case when freshly isolated, its cultural characters are very similar to B. paratyphosus B; when it produces gas in lactose it is more closely related to B. coli. The germ, however, as demonstrated by Castellani, Fulle, and Spaar is never agglutinated by either paratyphoid B or A serum, nor by any of the many coli sera tried.

There can, in my opinion, be no doubt that the case I have described is one of febris colombensis, as Castellani's bacillus colombensis (1905) was isolated from the stools and the blood agglutinated strongly both the strains isolated from the patient and the original Ceylon strain, while it did not present any agglutination for the typhoid, paratyphoid A and B bacilli, and Malta fever micrococcus. Moreover, the agglutination slowly and gradually decreased after the fever was over. This case shows that febris colombensis is not limited to the tropics, but is found also in temperate climates and must be regarded as a cosmopolitan disease.

Bibliography.—Castellani: Ceylon Medical Reports and Journal of the Ceylon Branch of the British Medical Association, 1905; Journal of Tropical Medicine, 1913, &c. Fulle: Sperimentale, 1914. Spaar: Journal of the Ceylon Branch of the British Medical Association, 1914; Journal of Tropical Medicine, December, 1915.

CASE OF INTRACRANIAL HÆMORRHAGE WITHOUT SYMPTOMS OF COMPRESSION.

BY P. W. LAM, M.B., CH.B. EDIN.;
AND
ED. LAW, M.B., CH.B. EDIN.,
RESIDENT SURGEONS, DISTRICT HOSPITAL, WEST BROMWICH.

IT is a matter of common knowledge that cases of head injury admitted to the casualty department of a general hospital often present difficulties in diagnosis, and the following case illustrates one of these difficulties.

The patient, a man aged 32, whilst cycling down an incline on Jan. 1st, 1916, collided with a cart. He was thrown off his bicycle and his head knocked against a post on the side of the road. On admission at 9.15 A.M., an hour after the accident, he was unconscious, but could be partially aroused by strong stimulus. The pulse was 76 per minute, respirations 18, and temperature 99° F. The pupils were equal in size, semi-dilated, and reacted sluggishly to light; the conjunctival

reflex was present. The skin was cold and pale. There was a wound on the right side of the scalp extending from before backwards for about 1 inch and situated over the right parietal eminence. From this a small quantity of blood was oozing. On probing, the wound was found to be quite superficial and no bare bone could be detected. No other injuries were present except a bruise over the upper part of the left arm. Two hours after admission he vomited a large quantity of coffee-coloured fluid and passed urine in bed. During the next nine days the temperature ranged from 97° to 98°; pulse from 60 to 140; and respirations from 18 to 30. There was no further vomiting, but involuntary micturition was repeated several times a day, and the bowels did not act except by enemata. He was restless during the first four days, but this was never very marked. The unconsciousness continued, but he could always be roused, and at times he would utter a few incoherent words. No spasms were ever noticed, nor were there any signs of paralysis, though these were repeatedly looked for. The pupils remained in the same state as on the day of admission. The respiration was always easy, never stertorous. On the morning of the tenth day the temperature rose to 101°, the pulse to 142, and the respirations to 32. He died at noon.

At the necropsy we found the following. Under the scalp wound, and running at right angles to it, was a very fine fissure in the right parietal bone, beginning at a point on the temporal ridge midway between the anterior and the posterior borders of the bone, and running downwards and forwards, becoming wider as it did so. This fissure was then continued into the anterior part of the squamous portion of the temporal bone, and into the greater wing of the sphenoid in the middle fossa of the skull. The whole length of the fissure measured 4½ inches. On opening the skull we found an extradural clot measuring 2½ inches × 2 inches, corresponding to the temporal lobe of the brain, but the brain itself showed no flattening at this part. The membranes were uniformly congested. The surface of the brain was also congested and œdematous, but the interior showed no changes.

With a history such as that presented by this case to make a diagnosis was difficult in the extreme, since we could detect no definite signs that compression was present.

WEST CORNWALL INFIRMARY, PENZANCE.—At the 107th annual meeting of the friends of this charity, held on Jan. 26th, it was stated that the late Mr. T. B. Bolitho had bequeathed £1000 to the funds of the infirmary. It was decided to use the money as a nucleus for raising a fund to provide a children's ward, which is much needed.

PENSIONS FOR NURSES.—In the matter of the charity hitherto known as "The Institution for Nurses for Nervous and Mental Disorders of Women" the Charity Commissioners have, at the request of the original trustees, promulgated a new scheme for its regulation and administration in substitution for the scheme of 1909–10, which is accordingly repealed. Under the new scheme the title of the charity is to be "The Mrs. Frances Sophia Caldwell Nurses' Fund," and the trustees are to be the corporate body called the Royal National Pension Fund for Nurses. The operative clauses provide that, after payment of expenses of management, &c., the trustees shall, out of the yearly income, pay an annual pension of £16 13*s.* 4*d.* to each of nine persons whose names are specified in a schedule; that, subject to this charge, the income shall be applied in providing pensions at such rates as the trustees may fix, having regard to the needs and circumstances of the pensioners and to the income and other circumstances of the charity. These pensions are to be for nurses who have served for not less than 12 years in connexion with cases of nervous and mental disorders of women and are in necessitous circumstances, and each pension will be granted in the first instance for a term of three years, but may be prolonged for a further period of not more than three years at each prolongation. If in any year the whole of the income is not expended the part remaining unapplied will be invested in augmentation of the capital endowments of the charity. The endowments at present consist of Consols, &c., of the aggregate value of £8036.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF SURGERY.

The Use of Condensers in the Diagnosis, Prognosis, and Treatment of Nerve Lesions.

A MEETING of this section was held on Feb. 2nd, Mr. J. MURRAY being in the chair.

Dr. F. HERNAMAN-JOHNSON read a paper on the Use of Condensers in the Diagnosis, Prognosis, and Treatment of Nerve Lesions.

Major C. F. BAILEY said that it should not be forgotten that the use of the condenser was only one of the methods which could be employed to estimate the degree of deviation of muscular contraction from the normal; it was, however, the most accurate. It was important to determine the smallest electric discharge which would just cause the muscle to react. The test should first be applied to the corresponding normal muscle and then, the conditions being unaltered, the affected muscle should be stimulated until the first visible contraction was obtained. The value of the stimulus could then be read off from the apparatus. He had been using a modification of the Lewis Jones condenser, whereby the electric discharge rose by increases of 25 volts from zero to 225 volts, and known resistances could also be thrown in. There were two arguable questions connected with the use of condensers: (*a*) whether all the muscles of the body react in a way similar to those selected by Lewis Jones; and (*b*) whether the skin resistance is really constant. Certain muscles of the foot did not contract to the Lewis Jones condensers of the lowest capacity, and those of the face, although they contracted to such condensers, would probably begin to do so to condensers of still lower capacity. He had devised his modification to overcome this difficulty. By starting with 25 volts and introducing greater resistance, examinations which would otherwise be impossible because of the pain were rendered trustworthy. He agreed that the reaction of degeneration gave little information. Sensory tests were also very important, and he considered that an estimation of the loss of epicritic sensibility was most valuable if properly carried out. He thought that the records of many of the cases of rapid recovery of sensation after operation were largely attributable to faulty methods of testing. He did not agree that a tetanising current should be used for treatment.

Dr. E. P. CUMBERBATCH said that the introduction of the condenser method marked a great advance because it measured the stimuli employed, but he objected to the use of numerals in recording the results of the tests as unscientific. "Reaction of degeneration" was an incorrect term, for it could be obtained in undegenerated muscle. He had seen muscles which required for their contraction the largest condenser in the box and yet the patient had voluntary control over them. He had found that when reaction of degeneration was present and yet voluntary power was retained the nerve was excitable to stimulation, and therefore recommended that the nerve-trunks should also be tested. He thought that this would provide a better indication as to diagnosis and prognosis than testing muscle contraction only. Observations at operations were incomplete unless the conductivity of the nerve was tested at the same time as its lesion was inspected. He thought that better results would attend treatment also if the ordinary constant current were used to stimulate the nerve, and attention was not devoted solely to the muscle. He did not agree that it was necessary to provoke contraction in the affected muscles; the sinusoidal current produced no contraction, yet cases so treated improved, whether the reaction of degeneration were present or not.

SECTION OF OPHTHALMOLOGY.

Exhibition of Cases.—Cause of the Ophthalmoscopic Appearances in Amaurotic Family Idiocy.—Superficial Linear Keratitis.—Cataract in Experimental Thyroidectomy.

A MEETING of this section was held on Feb. 2nd, Mr. PRIESTLEY SMITH, the President, being in the chair.

The following cases were shown:—

Mr. J. HERBERT FISHER: Arterio-venous Aneurysm.

Mr. ARNOLD LAWSON: Coloboma of the Upper Eyelid.
Dr. J. ATTLEE: Congenital Dermoid of the Conjunctiva.
Mr. G H. POOLEY: Lymphoma of Orbits.

A paper by the late Mr. GEORGE COATS was read by Mr. R. AFFLECK GREEVES, entitled "The Cause of the Ophthalmoscopic Appearances in Amaurotic Family Idiocy." The writer in this paper deals with a contribution by Dr. F. E. Batten and Mr. Stephen Mayou on Family Cerebral Degeneration with Macular Change, in which those authors state that there is a close relationship between these cases and the instances of amaurotic family idiocy, the only difference between them being that the macular region in amaurotic family idiocy shows a much more marked œdema of the internuclear layers, and therefore a white area around the macula associated with a hole or thinning of the retina at the fovea due to œdema, their conclusion being that œdema of the internuclear layers was present in both diseases, but much more markedly in amaurotic family idiocy. In the present paper it was stated that for a histological study of the retina the material must be absolutely fresh, as post-mortem changes begin two hours after death; fixation must be perfect (Zenker's solution being the best), and the method of cutting must be suitable. Mr. Coats considered that in the retina, apart from the occurrence of œdema, the macular changes show marked differences in the two diseases, and these were enumerated. He repudiated the view which had been ascribed to him that the ophthalmoscopic appearances in amaurotic family idiocy are due to coagulation necrosis. Though the particular form of chromolysis, vacuolisation, &c., which characterise family cerebral degeneration closely simulates that which is seen in amaurotic family idiocy the underlying cause may be different; and the race selectiveness of amaurotic family idiocy should cause hesitation in identifying it with a disease which is not race selective.—Mr. S. MAYOU, in discussing the paper, agreed that formalin, which was used in the case described by Dr. Batten and himself, was not a good fixative, but in one of the cases reported he thought the appearances could be fairly relied upon, except in regard to œdema in the internuclear layers.—Mr. E. TREACHER COLLINS thought the paper might well have been entitled "Causes of Opacity of the Retina," as it dealt with the wider subject. In the class of case investigated by Mr. Coats he seemed to have established that the opacity of the retina was due to a change in the ganglion cells.—Mr. J. H. PARSONS said he had cut sections from a case of amaurotic family idiocy, and there were large œdematous spaces similar to those in Dr. Batten's and Mr. Mayou's case, and he did not think they could be explained merely as the result of bad fixation. A good fixative, like the Zenker, might cause an artefact appearance in the opposite direction to that alleged in this paper. He regarded amaurotic family idiocy as one of the most sharply defined clinical entities known.

Mr. HOLMES SPICER and Mr. AFFLECK GREEVES contributed a paper on Superficial Linear Keratitis. The condition was one in which there were superficial ridges of epithelium raised above the level of the cornea, mostly running in vertical lines, grey and tapering, and having along their course bulging node-like appearances. They had tapering ends and did not extend quite to the limbus. They not uncommonly showed punctate staining, but there was no iritis. The tension of the eyeball was nearly always minus, and during such times the vision was definitely impaired, though it recovered when the normal tension was re-established. It differed from dendritic ulcer (which it appeared to simulate), especially in the reduced tension. No measures which he had employed prevented recurrences. A number of drawings and microphotographs illustrated the contribution.—The paper was discussed by Mr. J. COLE MARSHALL, Mr. J. B. LAWFORD, and Mr. D L. DAVIES.

Mr. WALTER EDMUNDS read a paper on Cataract in Experimental Thyroidectomy. He said he did not think the lens opacity was due to disease of the eye itself; in the dogs dealt with the pupil was active, and there was perception of light. He thought the cataract was due to the general nutritional changes following the removal of the thyroid gland, and the fits seemed to be due to that. Similar instances had been recorded in man. The cataractous changes which he found were not of the lamellar or any special type. When the parathyroids were also removed, the animal quickly sickened and died, the death being preceded by tremors.—The paper was discussed by Mr. PARSONS and Mr. FISHER, and Mr. EDMUNDS replied.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.

Exhibition of Specimens and Skiagrams.

A PATHOLOGICAL meeting of this society was held on Feb. 4th, Dr. LEONARD DOBSON, the President, being in the chair.

The PRESIDENT showed a specimen and microscopic section of Sarcoma of the Brain situated in the posterior part of the left middle frontal convolution. The first symptom in this case was an epileptic fit on Dec. 18th, followed by amnesia, aphasia, right hemiplegia, and death on Jan. 23rd. The patient was a man aged 47.

Dr. J. M. BERNSTEIN showed the following specimens: 1. Syphilitic Liver from a male child aged 7 months. 2. Large Aneurysm of Arch of Aorta. 3. Hodgkin's Disease showing Lymphoma of Breast. 4. Perforation of Œsophagus from fish bone; death from acute suppurative mediastinitis. 5. Polycystic Kidney. 6. Primary Sarcoma of Root of Lung; secondary growth in liver. He also described a case of Acute Lymphatic Leukæmia, from which he showed a blood-film.

Dr. ARTHUR SAUNDERS showed: 1. A kidney from a case of Acute Suppurative Nephritis affecting one kidney only in a child aged 1 year. 2. With Mr. H. Tyrrell Gray, a Parovarian Cyst from a child aged 2 years. 3. With Dr. Reginald Morton, a specimen and skiagram of a large Aortic Aneurysm.

Major W. MCADAM ECCLES, R.A.M.C. (T.F.), showed: 1. A microscopic section and skiagrams from a case of Mammary Tumour associated with a lesion of the tibia in a female aged 34. In this patient the head of the left fibula was found, on examination by Major McAdam Eccles, to be lying outside the external condyle of the femur; the shaft of the left tibia appeared to be displaced outwards and somewhat upwards, although the proximal epiphyseal part of the bone seemed to retain its normal relationship to the condyles of the femur. Examination of the right knee revealed a somewhat similar condition but in a much earlier stage, the fibula being in its normal position bu the tibia having distinct rarefaction. A section of tissue removed from the breast showed typical atrophic scirrhus, while that from the tibia gave no evidence of any neoplasm, primary or secondary. 2. Skiagrams of two wedge-shaped dorsal vertebræ from a male aged 28; no signs of any inflammatory mischief nor of any real "crushing."

Mr. H. S. SOUTTAR showed the following specimens: 1. Elephantiasis of Vulva; huge mass excised; patient eight months pregnant; later, normal confinement. The patient was aged 35. 2. Complete Prostatic Tumour removed by suprapubic operation from a patient aged 70. 3. Cystic Adenoma of Thyroid from a female aged 26. 4. Scirrhous Carcinoma of Breast; the patient was aged 50. 5. Carcinoma of Stomach; operation, partial gastrectomy and posterior gastro-jejunostomy; the patient was a male aged 65. 6. Large Nævo-lipoma of Face removed by excision. Mr. Souttar said that the patient in this case, a male aged 21, had those other congenital defects—viz., (*a*) spina bifida occulta over sacrum; (*b*) gross scoliosis, defective vertebra (first lumbar); (*c*) multiple nævo-lipomata on back; (*d*) aortic stenosis; (*e*) mitral regurgitation; (*f*) ? patent foramen ovale.

Mr. O. L. ADDISON described a case of Aneurysm of the Radial Artery at the back of the wrist in a female aged 73.

Dr. GEORGE PERNET showed: (1) Cultures of Favus in various media from the case of a child whose mother had suffered from favus for 30 years; (2) cultures of Ringworm; and (3) cultures of Streptothrix to compare with megalosporon ringworm.

Major J. M. ATKINSON, R.A.M.C. (T.F.), showed several skiagrams of injuries to bones due to shell.

Mr. H. TYRRELL GRAY showed the following skiagrams: (1) Congenital scoliosis, half lumbar vertebra only; (2) congenital absence of half the eighth and eleventh dorsal vertebræ, 13 ribs on one side and 12 ribs on the opposite side, congenital scoliosis; (3) congenital scolio-is, defective development of half the fifth dorsal vertebra; (4) spina bifida occulta, fourth lumbar vertebra; (5) congenital club-hand; (6) unusual type of tuberculous hip disease; (7) scoliosis in a boy due to shortening of one leg, of which the bones show a condition resembling fibro-cystic disease; and (8) tuberculous arthritis of ankle-joint.

Dr. REGINALD MORTON showed the following skiagrams: (1) Large aneurysm of arch of aorta, male aged 41, to illustrate radiographically Dr. Bernstein's specimen; (2) branched calculus in the pelvis of the right kidney, female aged 37, under the care of Mr. Souttar; (3) showing absorption of bodies of the fourth and fifth lumbar vertebræ following an attack of paratyphoid, for comparison with Major McAdam Eccles's skiagram showing wedge-shaped vertebræ, male aged 30, under the care of Dr. Saunders; (4) wrist showing changes in bones and joint spaces due to sepsis, male aged 24; (5) osteo-arthritis of left hip, male aged 43, under the care of Mr. Tyrrell Gray; (6) rarefying osteitis of upper end of tibia and fibula, female aged 37, under the care of Mr. Addison; (7) pathological dislocation of right hip from tuberculous disease, male aged 10, under the care of Mr. Addison; (8) skiagram showing early tuberculous invasion of lungs—striæ and mottling close in around the hilum, the periphery of the lungs clear. The detail in the latter skiagram was extremely fine, and this exhibit gave rise to an interesting discussion, in which the PRESIDENT, Dr. SAUNDERS, Mr. ADDISON, Dr. MORTON, and other members took part, on the value of radiography as a means of detecting pulmonary tuberculosis in its earliest stages, before physical signs make themselves apparent.

The PRESIDENT, Major MCADAM ECCLES, Mr. ADDISON, Mr. TYRRELL GRAY, Dr. SAUNDERS, Dr. H. PERCY POTTER, Mr. RICKARD W. LLOYD, Dr. BERNSTEIN, Dr. MORTON, and others discussed the various specimens and skiagrams shown at the meeting.

FULHAM MILITARY HOSPITAL.—A clinical meeting of the staff of this hospital was held on Jan. 11th, Major C. T. Parsons, the Officer Commanding, being in the chair.—Dr. S. H. Belfrage opened a discussion on Septic Compound Fractures due to Gunshot Wounds. He outlined the chief indications for treatment as being: (1) Vigorous treatment of the sepsis; (2) the securing of comfort to the patient and ease of nursing; (3) early movement of the joints; and (4) correction of deformity. He had found the ordinary splints of little use and anticipated much help from Hey Groves's modification of Hodgen. He emphasised the desirability of paying more attention to obtaining a useful limb than to accurate apposition of the fragments. It was doubtful whether extension could be usefully employed in the early stages; later on the fragments could be adjusted under an anæsthetic.—Mr. H. Chapple pointed out a fundamental difference in the treatment of fractures of the upper and lower extremities. In the arm the exact position of the fragments was often not of vital importance in the securing of a useful limb, but in the leg the necessity of parallelism for walking dictated the greatest care as to their position. He advocated operation where the disturbance of the fragments rendered it necessary, but in septic cases it was essential to wait until the sepsis had been dealt with before attempting plating. He also referred to a great truth established by Sir Arbuthnot Lane, that in dealing with a much comminuted fracture it was not necessary to get the whole circumference of the ends approximated. If a small portion were put in apposition the gap would be filled by new bone laid down, if the after treatment were suitable.—Captain J. R. Lee said that generally there was too much haste to remove sequestra. They should be left till complete separation occurred, as frequently an apparent sequestrum proved to be a focus of new bone formation. He wished to emphasise the importance in the treatment of sepsis of leaving, or if need be making, a very widely open wound, and meantime the surgeon should not be too anxious about the displacement of the fragments.—Dr. Carnegie Dickson referred to the extreme rapidity with which cancellous tissue can be absorbed to make room for active marrow in acute general diseases, and with regard to the question of the duration of a septic focus alluded to a case in which a projectile had been removed six months after complete healing, but in which at the operation pus was found containing organisms of feeble vitality but still capable of growth.—Dr. Kinnier Wilson, in discussing after-results, expressed the opinion that in some cases the disability of muscular movement was greater than could be explained by mere disuse. He considered that some cases were explicable on the theory that a defect was present in the reflex arc through the spinal cord. Possibly the constant afferent impulses from the diseased focus produced a dynamic functional change in the anterior horn cells and consequent muscular atrophy. Electrical treatment in such cases was more important than massage. Repeated efforts on the part of the patient sometimes sufficed to reawake innervation through the replex arc.—The Chairman dwelt on the debt the surgeon owed to X rays and advocated putting up fractures under X ray illumination. He was more inclined to the use of splinting than some speakers, as he considered the prevention of movement in the injured tissues was of great value in limiting sepsis. The joint involved in a septic process required immobilisation, while the other joints required to be moved. He considered continuous extension valuable and that often the weight applied was too small; attempts should be made from the first to rectify deformities. With regard to the all-important point of treating sepsis, he referred to the value of transverse incisions, which tended to remain gaping. The introduction of solid sodium chloride, which had given good results in France, should be tried, as also solid urea, on which Professor W. St. Clair Symmers, of Belfast, had reported favourably.[1] He had obtained good results in septic conditions by Bier's treatment before the war, and thought greater use might be made of it.

BRADFORD MEDICO-CHIRURGICAL SOCIETY.—A meeting of this society was held on Jan. 18th, Dr. J. T. Kitchin being in the chair.—Dr. F. W. Eurich showed microscopical sections and a case of Charcot's Disease of the Spinal Column.—Dr. T. Jason Wood showed pathological specimens and read notes of two cases of Abdominal Disease in Children. 1. A fine healthy child, aged 1 year, with the symptoms of intussusception. At the operation a large tuberculous mass was found in the mesentery causing kinking of the intestine. Lateral anastomosis was performed and the child made a perfect recovery. 2. A case of intestinal obstruction which at the operation was found to be caused by a mesenteric cyst which by dragging on the intestine had formed a sort of volvulus.—Dr. H. Vallow read a paper on Tuberculosis Arrangements from the Clinical Point of View. His conclusions were as follows: There should be a panel of practitioners always on the look-out for cases of tuberculosis; a tuberculosis dispensary equipped with all the apparatus requisite for the early diagnosis of tubercle, with a staff that has the confidence of the medical practitioners of the district; a sanatorium where the early hopeful cases can be sent to; a hospital for the more advanced cases; a home for the dying; a residential open-air school for the children; an open-air school for the children. Provision must be made for the home treatment of patients, with adequate nursing, visitation, and after-care in all its forms. It may also be necessary to have farm-colonies or cottages on the outskirts of the town where patients can sleep in the pure air; institutions for the treatment of surgical tuberculosis; and provision for the treatment of cases at the dispensary. It is also necessary for the local authorities to pay as much attention to the purification of the air-supply as they do to the water-supply. It is necessary for all these institutions to be clinically efficient, and for the medical officer of health, the tuberculosis officer, the practitioners, and the various help committees to unite together in face of the common foe.

---

[1] THE LANCET, Dec. 4th, 1915, p. 1237.

THE ANGLO-RUSSIAN HOSPITAL.—The Anglo-Russian Hospital at Petrograd, which is under the patronage of Queen Alexandra, was formally opened on Feb. 1st in the presence of the Empress Marie, the Grand Duchesses Olga and Tatiana, the Grand Duke Andrew Vladimirovitch, the British Ambassador and Lady Buchanan. The hospital will contain 200 beds. Lady Muriel Paget is the honorary organising secretary.

Dr. Alan McDougall has been awarded a special testimonial by the Royal Humane Society for his rescue work at the time of the sledging disaster at the Manchester Epileptic Colony, Sandle Bridge. The award states that he plunged into the water without taking off his clothing and saved three patients, nearly losing his own life in so doing.

Reviews and Notices of Books.

Post-mortem Methods. (Cambridge Public Health Series.)

By J. MARTIN BEATTIE, M.A., M.D. Edin., Professor of Bacteriology, University of Liverpool; formerly Joseph Hunter Professor of Pathology, University of Sheffield. With three figures in the text and eight plates. Cambridge: University Press. 1915. Pp. 231. Price 10*s.* 6*d.*

THE volumes of the Cambridge Public Health Series which have already appeared have been characterised by accuracy of statement and clarity of expression; the most recent addition, entitled "Post-mortem Methods," exhibits these virtues in an equal degree. Upon general grounds it might be asserted that the conduct and interpretation of necropsies had already been completely exhausted by numerous excellent volumes dealing with this special branch of medicine, and that no niche on our bookshelf could be usefully filled by the present one. Such, however, is not the case, and even a cursory glance through its pages shows that it goes a long way towards filling the gap the existence of which we have on several occasions indicated in these columns. Up to the present time there has been no post-mortem manual written by a pathologist who was at the same time a skilled and practical bacteriologist. Consequently the importance of the application of bacteriological methods as a routine measure to every necropsy has hitherto never been sufficiently emphasised. By his explicit instructions and constant references, Professor Beattie has done much to prevent the junior who follows his directions from seeking a haven of refuge in the diagnosis "status lymphaticus" before he has made a really exhaustive examination and drawn blank all the bacteriological covers.

The book comprises four main parts: In the first (Chapters I.–III.) we are rather surprised to see that Professor Beattie does not insist on the provision of a refrigerating chamber in connexion with the post-mortem room of the hospital pathologist, particularly in view of the fact that bacteriological investigations play so important a part in post-mortem work. His reasons for preferring to work without gloves are sound, but we note that the operator, whose hands are reproduced in the photograph, having discarded gloves, sets a bad example by retaining his ring. The methods recommended for opening the body and removing the organs are clearly those employed by the author himself; they are for the most part simple, and are set out with sufficiency of detail which renders them easily followed.

The second section (Chapters IV.–XI.) deals with the macroscopical examination of the organs, and in this connexion it may be noted that weights and lengths are given in metric measurements, usually accompanied by their English equivalents. Under each viscus the attention of the student is directed to the appearances of the naked eye lesions that may be present, and this section is particularly fruitful in those hints, suggestions, and explanations we have every reason to expect from a practical teacher of Professor Beattie's extensive experience.

The next section deals with medico-legal methods as applied chiefly to cases of suspected poisoning—no mention being made of sexual crimes or criminal abortions—and bacteriological methods to be employed when an experimental animal in the laboratory furnishes the cadaver. In this part Cobbett and Graham-Smith's instructions for examining birds are quoted *in extenso*. Then follows a series of notes on the points to be elucidated in a number of specified conditions and diseases; including the microscopical preparations to be made and the culture media to be inoculated when dealing with bacterial infections.

The last section (an appendix) gives instructions for the preservation of the natural colours of organs intended for museum preparations by various methods, preference being expressed for those of Jones or Pick; Frost solution being used for the final mounting and the sealing up of museum jars. The directions for the preparation of a few bacteriological culture-media, which occupy the final pages, are so few and so scrappy that their omission would have improved rather than detracted from the value of the book as a whole.

A full index completes a volume upon the production of which we offer the author our congratulations.

LIBRARY TABLE.

National Insurance Acts; *Handbook for the Use of Approved Societies*. English edition. London: Wyman and Sons, Limited. 1915. Pp. 324. Price 1*s.*—The Insurance Commissioners have issued in the form of a "Handbook for Approved Societies" a volume containing a considerable amount of information and advice, the object being to supply to the officers of the societies an official book of reference, information on procedure, and of guidance in applying the provisions of the Insurance Acts and of the regulations made under them. The present issue is described as provisional only, and as revised to August, 1915. It applies only to England. A more complete handbook is promised after the war, when our social organisation returns to normal courses. In its tentative form the handbook contains more than 300 pages, and although the greater part of it deals with financial and administrative matters of intrinsic interest only to the societies for which it is compiled, medical men upon the panels, and particularly those entering upon panel work, will find a good deal of matter for their consideration in the paragraphs dealing with certification and sickness benefit.

In the issuing of medical certificates many points of possible friction have made themselves felt, and the handbook appears to deal with these fairly and clearly; it should certainly assist the societies to carry out efficiently their duties in connexion with the distribution of sickness benefit. The fact that these duties are imposed upon the societies by the legislature, and the necessity for every society in the interest of its funds and of its members to exercise care in supervising claims will be found to explain much that is contained in the handbook on the subject of certification. In dealing with the subject of sick visiting it is pointed out, for example, in emphatic terms that the responsibility for determining whether a member is entitled to benefit rests not with the doctor who gives a medical certificate but with the society. That is to say, that although the medical certificate constitutes a very important part of the evidence upon which the society has to base its decision, it is not the only evidence that it may take into account in determining whether benefit is

payable. It will be observed, however, that the societies are expressly warned that their visitors cannot be expected, and should not be allowed, to act as medical advisers, and that the proper means of obtaining further evidence on matters which require any medical knowledge is to refer the case to the doctor in attendance or to a medical referee.

The paragraph relating to medical referees explains that, where a doubt exists as to whether sickness benefit should be paid after the medical certificates and the report of the sick visitor have been considered, the doctor in attendance may be able to help by supplying further particulars or otherwise, but that in some cases of uncertainty as to a medical point the proper course will be to refer the matter to a medical referee, first informing the doctor in attendance and taking care that he is aware of the time and place of any proposed examination. It is mentioned that power is given to the societies to require a member claiming benefit to submit himself to examination by a medical man appointed by the society and at the society's expense, and also that where in consequence of expenditure upon medical referees a deficiency occurs in its administration account, a society is allowed to carry a further limited sum to that account beyond the maximum amount ordinarily allowed by regulation.

Other paragraphs to which attention may be drawn with regard to certification are those which explain the procedure with regard to certificates given by medical men not upon the panels who are in attendance upon insured persons. The distinction between this form of practice, where the consent of the Insurance Committee has been obtained, and where it has not, is made clear, and it will be seen that from the point of view of the society, responsible as it is for the distribution of sickness benefit, the distinction is a necessary one. In any case, whether a medical practitioner acquiesces or not in the course taken by the officials of an Approved Society with regard to a patient under his care, he will be better able to form an opinion on the subject by knowing how far the action of the society is justified by official advice and authority. Therefore we recommend to all whom it may concern the purchase of this cheap handbook.

War and Civilisation: an Open Letter to a Swedish Professor. By J. M. ROBERTSON, M.P. London: George Allen and Unwin, Limited. Pp. 160. Price 2*s.* 6*d.* net.—In a series of trenchant chapters Mr. Robertson gives a reply to a Swedish professor of economic and social science who undertook to set forth the real "rights and wrongs" of the present war. Dr. Steffen is perhaps hardly a worthy antagonist, inasmuch as he justifies his vaunted ten years' acquaintance with English habits of thought by isolated extracts from newspapers instead of by responsible pronouncements of statesmen, and finds the typical Englishman in some of Mr. Galsworthy's most unrighteous and unlovable characterisations. Hence Mr. Robertson has no serious difficulty in demolishing the superstructure built on this crumbling foundation. Mr. Robertson is himself one of those who "have seen in war the great negation of human progress, the destroyer of a hundred civilisations, the final failure of reason to regulate international life," and he finds the German people deficient in that most essential thing, the knowledge of the way of working of the souls of nations and of free men. His book will be read with pleasure for its keenness and fairness of thought and expression.

JOURNALS.

Quarterly Journal of Experimental Physiology. Edited by E. A. SCHÄFER, W. D. HALLIBURTON, C. S. SHERRINGTON, E. H. STARLING, and A. D. WALLER. Vol. IX., No. 3. London: Charles Griffin and Co., Limited. 1915. Pp. 199–279. Price 7*s.* 6*d.*—On the Mode of Origination of Labyrinthine and Cervical Tonic Reflexes and on their Part in the Reflex Reactions of the Decerebrate Preparation, by J. S. Breitoff. This elaborate research was carried out in the Imperial University of Petrograd. The author's conclusions alone and summary of his work extend to over three pages. The experiments were made on decerebrate cats. Antagonistic muscles—e.g., vasto-crureus and semitendinosus—were isolated and their actions simultaneously recorded. The view is generally held that certain labyrinth tonic reflexes in certain positions of the head in space are produced directly under the continuous excitement of the labyrinthine receptors. The author made the observation on antagonistic muscles that a weak peripheral stimulation evokes in them a tonic reflex in harmony with the posture then obtaining in the head. The author's results, which are set out at length, do not lend themselves to a short summary, and one must refer those interested to the communication itself.—On the Accumulation of Gas in the Tissues of the Frog as a Result of Prolonged Submersion in Water, by A. T. Cameron and T. I. Brownlee. The authors find that: 1. Specimens of Rana pipiens immersed in Winnipeg tap-water during late winter and spring will live on the average 16 days. The extreme periods observed were three and 52 days. 2. The frogs remain perfectly normal for some time, but at a variable period before death ensues—usually several days—they commence to swell. The swelling in all cases is due to the absorption of water, and in most cases this is accompanied by retention of absorbed nitrogen, resulting in a degree of buoyancy which tends to keep the frogs at the surface of the water. The authors discuss the probable causes of these phenomena.—The Upper Limit of Temperature Compatible with Life in the Frog, by A. T. Cameron and T. I. Brownlee. The authors had previously determined the lower limits of temperature compatible with life in the frog. These were found to be $-1{\cdot}25° \pm 0{\cdot}15°$ C. for R. pipiens and for R. clamitans and R. sphenocephala two to three-tenths of a degree higher. The minimal temperature was maintained for one hour. Three series of experiments were made: 1. On the intact animal immersed in water. 2. On the intact animal in air saturated with water vapour and kept at a constant temperature. 3. On exsected heart, muscle, and nerve, chiefly in late winter and spring specimens of R. pipiens. In the air experiments the highest temperature at which R. pipiens can maintain life indefinitely is about 18° C., while a temperature a degree or two higher proves fatal in a few days. The cause of somatic death cannot be stated. The heart was found functioning in numerous cases where somatic death has occurred. The experiments in water indicate a similar limiting temperature. The fatal effects are more rapid. The experiments on exsected muscle show the important relationship between temperature and time. The authors are unable to state the cause of death of muscle at moderate temperatures (25°–35° C.).—The Proprioceptive Reflex of a Flexor Muscle, by Chuai Asayama. Decerebrate cats were used. It was found that (1) quick stretching of tibialis anticus, the chief flexor of the ankle-joint, by a sharp pull on its tendon elicits a reflex contraction of the muscle; it can also be obtained in the intact animal under narcosis, but is more marked in the decerebrate preparation; (2) the reaction is a proprioceptive reflex, the only afferent nerve required being that belonging to the muscle itself; (3) the minimal amount of stretching required to evoke the reaction is very small; (4) the rate of stretching is important—a slow stretching, however ample, does not evoke the reflex; (5) the latent period is shorter than that for reflexes evoked from the muscle by other afferent channels; (6) when the reflex response of the muscle has been tired out for the ordinary "flexion-reflex," this proprioceptive stretch-reflex persists unaffected by that fatigue; (7) strychnine increases the reflex.

CLINICAL REPORT ON THE APPLICATIONS OF EUSOL.

REPORT TO THE MEDICAL RESEARCH COMMITTEE.

THE following concludes the Report to the Medical Research Committee, the first part of which appeared in our issue of last week. The Report is signed on behalf of the Edinburgh Committee by the chairman, Major James Hodsdon, President of the Royal College of Surgeons of Edinburgh.

1. RECENT ACCIDENTAL WOUNDS.

Cases tabulated from the surgical out-patient department, Royal Infirmary, show that 86 per cent. of recent wounds remained aseptic. This result was obtained by means of free application of eusol before dressing. A dressing of gauze soaked in eusol was applied over the wound after stitching and in a few cases this was covered with jaconet. As a rule, however, the dry dressing was sufficient to keep the wound aseptic. It has been noted that in the treatment of small wounds where there is every probability of sepsis, it is a good plan to apply a eusol soak for the first 24 hours—i.e., before stitching, and thereafter a dry dressing. This renders drainage unnecessary. Of the cases that became septic (10 per cent.) this was, as a rule, due to the fact that the patient did not return when directed or interfered with the dressing. One or two of the cases became slightly septic during treatment. This occurred, however, before the value of preliminary treatment in certain cases with soaks had been realised.

Mr. Jardine and Lieutenant Cameron's Case.

TABLE A, CASE 47.—Case of street accident. The patient had been knocked down by a tramcar and the street dirt had been ground into the interior of a scalp wound 4½ inches long. The tissues were quite black and it was impossible to remove the dirt by sponging. The gross dirt was cut away and the wound and surrounding parts were thoroughly sponged with eusol; the wound was then packed with gauze impregnated with eusol and a eusol soak was applied over the surface. The wound was not stitched as it was so dirty. Twenty-four hours later when the packing was removed the wound was clean enough for partial stitching. The slight discharge of pus entirely ceased in 5 days, and 9 days later patient was discharged cured.

Captain Stuart's Case.

TABLE B, CASE 1.—Motor-car accident; overturning on hard country road. Large antero-posterior scalp wound from anterior margin of hair almost to external occipital protuberance; much undermining of flaps, extending on one side to base of mastoid, part of pericranium being torn away, with exposure of bone. There was a second scalp wound about 4 inches long on the other side of the scalp, also much undermined. There was much infiltration of the deep surface of the scalp flaps and of the pericranium with road dust. Wounds were thoroughly washed out with eusol and dirty tags were cut away, but it was impossible to remove the dirt completely. Gauze swabs soaked in eusol were laid under the scalp flaps and left there while the scalp was being shaved and painted with iodine; no iodine was put on the wound edges nor into the wound. The smaller wound was closed without drainage; the larger one was completely closed, but a small tube was introduced into the cavity through a stab opening above the ear. Both wounds healed by first intention without a sign of sepsis.

TABLE B, CASE 2.—Same accident as B, 1. Antero-posterior wound of scalp beginning close above the right eye, passing through the eyebrow, up the forehead, and backwards to rather beyond the level of the external occipital protuberance. The lateral flap of the scalp had been raised, as in the previous case, down to the mastoid. There was another long wound on the left side of the scalp with undermined edges, and a small wound farther back. Pericranium was exposed and parts of it torn away. There was not much road dirt in the wounds. The case was dealt with in precisely the same way as B, 1. All the wounds were stitched up completely, but small pieces of tubing were introduced through stab openings into the large wound. All healed by first intention with the exception of a small circumscribed area in front of the ear; a small abscess formed and was incised.

Captain Stiles's Case.

TABLE A, CASE 9. *Septic burn of thorax.*—An extensive superficial burn of the thorax of 2 weeks' duration was dressed twice daily with eusol. On admission the ulcer was dirty, covered with large greyish-yellow sloughs, and showed no sign of healing. Within 5 days the sloughs had entirely separated, leaving a healthy granulating surface, dotted here and there with islands of epithelium. The granulations after another 2 days became so vascular that the eusol dressings were stopped and boracic substituted. The child was discharged 7 days after admission and treated as an out-patient. There is no doubt that the eusol cleaned up and stimulated the burn with greater rapidity than any other antiseptic used here. (Royal Hospital for Sick Children, Edinburgh.)

Mr. J. M. Graham's Cases.

TABLE A, CASE 94. *Partial avulsion of the scalp treated by eusol.*—The patient, a boy aged 4, was knocked over by a motor-car on Nov. 29th, 1915. He was dragged for a considerable distance, and was brought into hospital unconscious. It was then found that the scalp was cut to the bone transversely from ear to ear and the posterior portion was completely separated from the cranium. Much dirt was ground into the edges of the wound, into the under surface of the flap, and also into the surface of the bones of the skull, which were exposed. Three hours after the injury the patient had recovered consciousness and under a general anæsthetic the scalp and exposed parts were cleansed with eusol. Portions of dirt were removed with forceps and by clipping the tissues with scissors. The parts were sponged with gauze soaked in eusol, and the latter was freely used to wash out the recesses of the wound. After thorough cleansing the wound was completely stitched up after the insertion of two small drainage-tubes at dependent points. The wound healed by first intention.

TABLE A, CASE 95. *Severe laceration of right arm requiring amputation.*—The patient, a boy aged 15, fell off a railway engine, a wheel passing over his right arm. He was seen in hospital four hours after his injury, a tourniquet which was applied at the time of the accident still being in position. The skin, muscles, and other tissues about the elbow were much torn, and the raw surfaces were ingrained with dirt; the lower third of the humerus was comminuted and the elbow-joint dislocated. The skin was completely stripped off the muscles as far as the shoulder-joint. An anæsthetic was administered and a circular amputation performed through the middle of the upper arm, the skin and the wound having first been thoroughly washed with swabs soaked in eusol. The stump healed by first intention.

TABLE A, CASE 96.—The patient was a man aged 60. Both hands were crushed by the wheels of a light engine. On admission he was very collapsed and was suffering from severe shock. The left hand was practically reduced to pulp, and was only connected to the arm by a confused mass of torn tendons. The right hand was severely damaged and the thumb was missing. All the fingers were crushed and metacarpal bones broken, except that of the little finger. Part of the skin of the palm was intact. The following treatment was carried out four hours after the accident. Right hand: Careful cleansing with eusol; damaged parts removed; tendons stitched over the carpus and flaps sutured in position. The base of the thumb and entire little finger were saved. Left hand: Amputation was necessary above the wrist. The parts were thoroughly irrigated with eusol. The raw surfaces were black with dirt. Saline enemata were administered. After-progress: The right hand healed by first intention, with the exception of a little necrosis at the line of suture. In the left hand a considerable slough formed at the apex of the dorsal flap owing to lack of vitality in the skin. This was associated with slight sepsis, which disappeared with removal of the slough.

TABLE A, CASE 97. *Compound comminuted fracture of the elbow region.*—The patient was a man aged 69, who was admitted 1¼ hours after being knocked down by a passing goods trains, four wagons passing over his elbow. On admission there was considerable shock; subnormal temperature (95° F.). One large wound, 3 in. long and 2 in. broad, was situated in front of and above the head of the radius. There were several smaller wounds and much general bruising of the arm. The raw surface was ingrained with dirt. There was a compound, much comminuted fracture of the lower end of the humerus. As the radial pulse was good and there was no evidence of destruction of nerves, it was decided to try to save the arm. The wound was thoroughly irrigated with eusol and packed with swabs wrung out of eusol. The arm was laid on a pillow with the intention of securing ankylosis. The radiogram showed a comminuted fracture of all the bones entering into the elbow-joint. After-progress: A large amount of muscle and some skin sloughed during the first week. A slight amount of suppuration was present and numerous fragments of bone were removed. The patient is still under treatment, having just had a large sequestrum removed. On the whole the result has been very satisfactory, as the patient has now considerable power of movement at the elbow-joint. Considering the severe nature of the injury, it was doubtful at the time whether the arm could be saved at all.

2. WOUNDS ALREADY SEPTIC.

Where septic processes are already present in the wound the treatment has usually been carried out by means of syringing and soaks or baths. The aim is in the first place to eliminate sepsis. If it be necessary for this purpose to apply eusol every four hours a drainage-tube should be inserted and so arranged that it can be used as a channel for irrigating the wound with a minimum disturbance of the dressings. In a septic cavity the antiseptic, warmed to body temperature, should be brought into contact with all the recesses and applied as freely as possible to the whole of the infected area. Hypochlorous acid forms a compound with the albuminous substances in the exudate and is thereby decomposed, but the compound is itself an antiseptic. To secure the elimination of sepsis it is important, therefore, to flush the cavity freely.

The eusol brings about separation of the sloughs and formation of a covering of granulation tissue over the raw surface. A minimal amount of discharge remains consisting of serous fluid, and this can be absorbed by a loose packing of gauze soaked in eusol; the wound is thereby kept sufficiently dry while healing proceeds. Where a tube is combined with the gauze the tube should be removed once and the gauze at least twice in 24 hours in the earlier stages of the treatment.

It has been found beneficial in some cases to change the treatment after granulations have formed. Eusol may be alternated with another form of dressing, or it may be discontinued when the sepsis is under control. Any tendency to exuberant growth of granulations and delay in healing can be counteracted in various ways indicated in the notes on the cases.

While the cases recorded are sufficient to indicate the general principles involved in the treatment of wounds by eusol, further experience is required to determine the methods appropriate to wounds of a special or unusual character.

Major Hodsdon and Mr. Wood's Cases.

TABLE B, CASE 25.—A sailor had both legs injured by shell fire and amputation of the right was performed. When the patient reached Edinburgh Royal Infirmary the flaps covering the stump had become gangrenous and sloughing; there was a foul discharge. Washing and dry dressing with eusol for 13 days cleaned up the surface and skin grafting was successfully carried out.

In the following four cases the patients were wounded on Sept. 25th and admitted to the Royal Infirmary on Oct. 5th.

TABLE B, CASE 26.—A very severe case of compound fracture of the arm, with splintering of the lower third of the humerus and upper third of the radius and ulna. Copious purulent discharge. After the wound had been opened up to allow free drainage and application of eusol, the arm healed rapidly and the patient's general condition improved markedly. The discharge had practically ceased in 19 days.

TABLE B, CASE 27.—This was a case of compound fracture of both bones of the forearm. There were two large gaping wounds, with a copious offensive discharge. The lower part of the ulna was completely shattered. The wound here was treated by syringing and wet dressing once daily. In 5 days the wound was much cleaner, and in 4 weeks both wounds were in the condition of a healthy sore. The wound cleaned up remarkably well.

TABLE B, CASE 28.—This was a case of bullet wound in the palm of the right hand It was very dirty and discharging pus freely; the hand was swollen and inflamed. It was treated by syringing and wet dressing once daily, and in 9 days the wound was almost clean. Eusol cleaned up this case and reduced the amount of discharge very quickly. Numerous splinters of shrapnel had to be removed. Apart from this the wound was completely healed in a fortnight.

TABLE B, CASE 29.—This was a case of compound fracture of left femur. The wound through the thigh was very septic and foul-smelling. A large cavity was present in connexion with the exit wound. The wound was syringed and wet dressed twice daily. There was distinct improvement in 6 days. Nine days after this a large sequestrum was removed, and 13 days later a piece of shrapnel was removed and another piece 5 days later. The wound healed up rapidly and the bones became quite firm.

Major Wallace and Dr. Bennet Clark's Cases.

TABLE B, CASE 48.—This was a case of shrapnel wound of the upper arm. There was a sinus about 2 inches long, which was not healing. It was 17 days old. The sinus was treated for 14 days with eusol soaks every 4 hours. At the end of this time treatment was changed to syringing and dry dressing twice daily. Under the latter treatment it healed in 6 days. This case exemplifies the fact that the mode of application of eusol is highly important, and that it must be directly applied to the infected surface.

TABLE B, CASE 52.—This was a case of large superficial lacerated wound of the forearm, covered with sloughs, discharging profusely. The pus was thick and foul-smelling. It was treated with eusol soaks, 4-hourly, and was sufficiently clean for skin-grafting in 8 days; it was completely healed a fortnight later. This was considered a very successful case.

TABLE B, CASE 43.—This was a case of superficial shrapnel wound of 48 days' standing; it was situated in the shoulder and was very foul. Eusol soaks applied every four hours cleaned the wound and it was healing rapidly after 10 days.

Dr. R. W. Johnston's Case.

TABLE B, CASE 57.—This was a case of compound fracture of the femur. There had been six operations during a period of 8 months. At the time when eusol treatment was commenced there were two septic sinuses each 4 inches deep leading down to the femur, and it was suspected at first that dead bone was present. The sinuses were irrigated with eusol twice daily and lightly packed with worsted soaked in eusol. The sinuses healed in 6 weeks. The record continues: "In view of the long history of sepsis this is a remarkably satisfactory result. Patient was discharged for light duty."

Captain J. W. Stuart and Dr. Andrew Rutherford's Case.

TABLE B, CASE 40.—This was a case of shrapnel wound of the foot. Amputation through the thigh was done because of rapidly spreading gangrene. When the patient reached the Deaconess Hospital the stitches had burst, the flaps having given way and receded for a considerable distance, leaving the stump of the bone exposed. The surface of the flaps was bathed in pus and emitted a fœtid odour. It was treated with soaks twice daily and eusol was poured into the dressing every 4 hours by a tube which had been inserted

for the purpose. The surface of the wound became healthy and the end of the bone became covered with healthy granulations. It was originally intended to remove some of the bone and make new flaps, but this was found unnecessary.

Note by Lieutenant-Colonel Caird.

"Military cases: Gunshot and shrapnel wounds. Fifteen cases, admitted 7 to 10 days after receipt of injury, all septic and suppurating, progressed in a satisfactory manner. None had rise of pulse or temperature and all healed well, although three were very slow. One case proved fatal where an operation to remove a small sequestrum from the tibia was followed by an acute septicæmia and endocarditis which carried off the patient on the eighteenth day." The post-mortem examination showed chronic and acute endocarditis of the aortic valve. Septic thrombosis of the femoral vein, and infarction of the spleen.

"One case, a disarticulation at the knee-joint, with retracted flaps and protruding extremity of femur, was admitted 17 days after operation. The wound was sloughy; temperature 102°; pulse 120. Eusol dressing applied August 10th. Temperature normal; wound granulating and pulse normal August 20th. Healing thereafter promoted by change of dressing and epithelial grafting."

Note by Captain Stiles.

"I may say that I have used eusol in many other cases besides those referred to in the tables. The conclusions I have come to are that eusol is the most efficient antiseptic we possess in the treatment of the lacerated and contused wounds and compound fractures such as are met with in military practice. It brings about the rapid separation of the sloughs and healthy granulations form more rapidly than under the use of any other antiseptic; its continued use causes an excessive growth of very vascular granulations so that bleeding from them is more severe than usual. During the later stages of the treatment, therefore, it is advisable to substitute either hypertonic salt solution or boracic for the eusol."

Captain A. A. Scott Skirving

Writes that he has employed eusol in several hundred cases in Cragleith and Bangour Military Hospitals and in civil practice. His experience has been such as to lead him to order it as a routine treatment in every case where an open wound existed, and the results obtained have justified its use.

Note by Captain Beesly, Surgeon Specialist, the Military Hospital, Edinburgh.

"The only cases in which there has been a suitable opportunity for testing thoroughly the value of eusol in the Military Hospital, Edinburgh, have been those of chronic localised sepsis of bones usually associated with cavities and sequestra. Such cases have been plentiful, and the eight months which have elapsed since the treatment described below was first begun have allowed time for a definite opinion to be formed regarding the advantages possessed by eusol.

Many of the patients under consideration had had four or five previous operations, and, as far as could be made out, the recurrences were due to healing of the superficial soft structures before the underlying bone had healed. In view of this the following method was adopted. The area dealt with was widely opened up, the sequestra removed, and the cavity or cavities bevelled away as flat as the security to the shaft of the bone permitted. Thereafter the area was kept wide open and the cavity down to the bone, lined with a sheet of perforated green protective, was packed with iodoform gauze to keep it fresh and to control the oozing. This dressing was not changed for three days.

This primary iodoform dressing was found more satisfactory than gauze soaked in eusol, as the latter required to be changed daily. The subsequent dressings carried out daily comprised washing the area thoroughly with warm eusol (0·5 per cent. hypochlorous acid) and packing it in the same manner as before, but with the gauze soaked in eusol. By this method the area was kept permanently clean, the serous discharge reduced to a minimum, and the granulation tissue never became vegetative.

It was noticed that eusol could be applied continuously in the prolonged treatment necessary for the closure of these large open wounds, whereas other applications could not be so used and required to be alternated with each other.

A distinct advantage of the eusol dressing is the marked reduction of the serous exudate. This allows the deeper parts of the wound to be lightly packed and the superficial area to be firmly packed, there being no question as to obstructing the outflow of the discharge. In this way the superficial tissues are kept widely separated, and the deeply seated wound in the bone can be observed healing. The very slight amount of serous discharge which occurs readily passes through the perforated green protective and is absorbed by the eusol gauze, which, however, never becomes sodden, and in no case thus treated was there trouble from hæmorrhage or overgrowth of granulations.

There has been little opportunity of testing the value of eusol in acute suppurative cases, but in a few patients with gangrenous appendicitis it was noted that the period of drainage and pus discharge was much curtailed when the area was thoroughly cleansed with eusol. In three such cases the tubes were removed upon the third day, and all discharge had ceased by the sixth day. These patients left hospital completely healed in 21 days."

3. SEROUS AND SYNOVIAL CAVITIES.

Note by Lieutenant-Colonel Caird.

"Cases of extravasation of urine and gangrenous appendicitis with fæcal fistula; temperature was reduced and sepsis controlled on being treated with eusol."

Mr. W. Q. Wood's Case.

TABLE A, CASE 39.—In this case—one of perforated gangrenous appendix—the patient was very collapsed on admission, with a temperature of 100° F. and a pulse of 132. She had been ill for 5 days. Immediate operation. Patient had general peritonitis, with foul-smelling pus and a quantity of free gas throughout the lower part of the abdomen. The abdomen was freely douched out with eusol. The patient made an uninterrupted recovery. This case demonstrates the fact that eusol can be employed in the peritoneal cavity with the greatest safety.

Note by Captain Stiles.

"In the Hospital for Sick Children the method of treatment in cases of appendicitis is to irrigate the drainage tracks freely twice daily two days after the operation. Formerly peroxide of hydrogen was used for this purpose; better results, however, have been obtained by application of eusol, and the patients are discharged about a week earlier than was previously the case."

Note by Captain Stuart.

"*Appendix cases.*—I have employed eusol during the last seven months in 14 cases of acute appendicitis, where the appendix was gangrenous and perforated, with offensive pus round it. In all cases the peritoneal cavity was necessarily opened, the appendix was removed, and a rubber tube left in the lateral wound, while a glass tube was introduced to the bottom of the pelvis through a suprapubic opening. The glass tube was almost invariably removed on the second or third day, and the rubber tube gradually shortened till healing occurred. In the early cases no eusol was employed at the operation. The cases in question all behaved in very much the same way. There was a fairly profuse very offensive discharge from the lateral tube, and on about the fourth or fifth day, the larger rubber tube having been taken out, a small one was passed down to the bottom of the wound and about half a pint of eusol syringed down the tube, so as to well out by the side of it, the larger tube being again replaced. In a few cases this was done twice daily for two or three days, and then once daily: in most of the cases only one daily dressing was performed from the first. As a rule, in two to four days the smell had practically disappeared, the infection disappearing with a rapidity which I have not seen under any other treatment. When the sinus became practically aseptic, the use of eusol was stopped, otherwise healing was delayed.

In the last two or three cases I have at the operation swabbed out the region of the appendix with slightly warmed, and therefore slightly dilute, eusol, and poured it through the lateral wound down into the pelvis. This eusol was sucked out again through the suprapubic tube at the close of the operation. I have not yet done this often enough to form an opinion regarding it, but in these very few cases I think that the discharge afterwards was less profuse and less offensive, though asepsis was not secured."

Note by Captain Stiles.

"*Empyema.*—In my experience empyemas do well if they are opened early and if a large enough opening is made to enable the fibrinous masses to be removed. If this is done there is usually no need to keep the tube in more than a few days. The main point, however, in the after-treatment is the prevention of mixed infection. This is best effected by the application of a large eusol dressing, which should be changed daily. And this leads me to say that I have met with no cases in which any irritation of the skin has resulted. While I have not thought it necessary to douche out the pleural cavity at the operation, I have found that in old-standing fœtid empyemas the best results are to be got by free irrigation with eusol, as by this means the fœtor is more rapidly controlled than by the use of any other antiseptic, and the fever is at the same time more effectively reduced."

Major Hodsdon's Case.

"*Streptococcal synovitis.*—Patient was wounded in the left leg in Gallipoli on Oct. 25th. A bullet was removed from the leg on Nov. 8th on board a hospital ship. When he was admitted into the Royal Infirmary on Nov. 16th there were three large suppurating wounds in the calf. An abscess over the internal malleolus was opened on Nov. 24th. On the 26th the temperature was 102°–103° F.; pulse 120–125. There was effusion into the knee-joint. The joint was aspirated on the following day; sero-purulent fluid (which gave a pure culture of streptococci) was drawn off and 2 oz. of eusol injected into the joint. The knee improved during the next 24 hours. On Nov. 30th the temperature was 102°; pulse 112–124; the joint tightly distended and very tender to touch. The patient was extremely ill and toxic in appearance. Under general anæsthesia the effusion, which was now purulent (and still gave a pure culture of streptococci), was removed by aspiration, the joint washed out with eusol and freely moved until the fluid which returned was clear; finally the synovial cavity was distended with eusol, the puncture being closed by a clip to prevent escape of the antiseptic. The following day the general and local conditions showed marked improvement and the joint was painless to touch. The temperature, however, remained at 101°–102° and the pulse at 112–118 until Dec. 3rd, when a collection of pus was evacuated from the lower third of the thigh. Two days later the temperature was normal, the pulse 108, the joint condition had completely subsided, and passive movement was painless."

4. MUCOUS SURFACES.

In acutely inflamed mucous surfaces the application of eusol may produce pain and discomfort. On the other hand, in chronic inflammation even the full strength can be easily borne. In the tables only a few cases are recorded of application to mucous surfaces. In cases of cystitis or colitis the eusol for the first application may be diluted with warm normal saline to 1 in 10, but it will be found that the patient can soon tolerate a much greater concentration.

Lieutenant-Colonel Caird's Case.

"Suprapubic removal of extensive papillomata of bladder; great hæmaturia; foul urine. On the day after operation the temperature rose to 100° F., the pulse to 120, and the following day the patient looked very ill. The bladder was washed out with eusol, and at night the temperature was normal and the pulse had fallen to 112. Subsequent progress satisfactory."

5. INFLAMMATORY LESIONS.

(*a*) *Cellulitis.*

Captain Stiles's Case.

TABLE A, CASE 36.—The patient was a nurse who had a whitlow of the thumb. She was very ill, with a temperature of 104° F. and a suppurative condition extending along the long flexor of the thumb into the forearm. There was marked œdema of the thumb with swelling and tenderness of the axillary glands. A free incision was made in the palm and another longer one in the forearm down on to the flexor longus pollicis tendon. The limb was then placed in a eusol bath for two hours twice daily, and in the intervals a boric bath was substituted. The fever disappeared in a few days, the œdema quickly subsided, and the wound rapidly became covered with healthy granulations.

(*b*) *Abscess.* (See Table A, Cases 25 and 26.)

(*c*) *Amputations through Septic Tissues.*

Note by Captain Stiles.

"In performing these amputations I have been gratified to find that by douching the flaps very freely with eusol and applying eusol dressings very frequently the healing has been almost as rapid as in an aseptic amputation."

While the report does not include cases of amputation for "gas gangrene" the committee may be permitted to refer to the results obtained by Captain John Fraser in the field, an account of which was published in the *British Medical Journal* on Oct. 9th, 1915. He showed that by the application of eusol he was enabled to amputate successfully through infected tissue.

(*d*) *Arthritis with Mixed Infection, Amputation.*

Captain Stiles's Cases.

TABLE A, CASE 24.—"This was a case of very advanced hip-joint disease with extensive involvement of the acetabulum and septic sinuses. At the operation the sinuses were dissected away as far as possible, and after thoroughly irrigating the wound with eusol, eupad was freely applied to the curetted acetabulum and to the unhealthy tissues round about the sinuses. The child's condition improved very quickly, and I am satisfied that the healing process was more rapid than I had been accustomed to see in similar cases which had not been treated with eusol.

The beneficial action of eusol was even more strikingly shown in another amputation of the hip-joint in a child who had suffered from severe osteomyelitis of the shaft of the femur with secondary involvement of the hip-joint. The flaps healed practically by first intention and the child, who was almost moribund at the time, put on weight with great rapidity, and is now, eight weeks after the operation, in robust health. No doubt the removal of the septic area accounted for the child's recovery, but the eusol, in my opinion, certainly added greatly to the rapidity and completeness of the convalescence."

(*e*) *Tuberculosis of Bones.*

Note by Captain Stiles.

"After removing the tuberculous focus it has been my practice recently to apply eupad freely to the cavity which has been left, using it as a substitute for sublimated iodoform bismuth paste. I have also applied it freely to the curetted acetabulum after excising the hip for tuberculous disease. I have then stitched the muscles over the trochanter and closed the wound without drainage. The eupad did not appear to produce any pain or irritation. Healing by first intention resulted, but the same has occurred after the application of sublimated iodoform bismuth paste."

6. SKIN INFECTION.

Dr. J. W. Crerar's Case.

"Case of coccogenic sycosis (Unna) treated with eupad. On Sept. 20th Lieutenant S. presented himself with extensive pustular eruption of chin, cheeks, and neck, the pustules closely aggregated on chin, especially just below the lower lip, discrete on the cheeks and neck. A paste of eupad and water was thoroughly rubbed into the whole infected area and left in contact for 15 minutes. This was washed off and an indifferent bland ointment was ordered. On Sept. 22nd (two days later) close examination with a lens revealed only 3 small pustules on the neck. To these a paste of eupad was applied. On the 24th (two days later) 3 fresh pustules were seen and similarly treated; no others to be seen. On the 27th (three days later) careful examination failed to reveal a single pustule. Cheeks and neck were normal and the only sign of the condition was slight (non-pustular) excoriation below the lower lip. Treatment completely cured the condition within one week. Cultures from a pustule gave a growth of staphylococcus pyogenes aureus. For application of eupad in this manner it is advisable to place a pad of gauze moistened with solution of sodium hyposulphite over the mouth and nose to prevent respiratory irritation from the hypochlorous acid gas."

7. RECTAL OPERATION.

Major Hodsdon and Mr. Wood's Case.

TABLE A, CASE 5.—"A feeble man aged 68. Colostomy on August 15th; the lower part of the rectum and anal canal excised under spinal anæsthesia on August 26th; wound packed with iodoform gauze. On the evening of the 26th the temperature was 99° F. and pulse 120. On the morning of the 27th the wound was sloughy and the discharge very fœtid; temperature 98·4°, pulse 124. The wound was syringed out with eusol and packed with gauze dusted with eupad. That night the pulse-rate fell to 88 and subsequently never exceeded 96. The fœtor rapidly diminished; the wound was granulating on the third day and healing satisfactorily. The eupad packing was discontinued on August 30th; the syringing once daily with eusol was continued until Sept. 20th."

Captain Stiles's Case.

TABLE A, CASE 6.—"The wound was that of a large carcinoma of the rectum just within reach of the finger. A preliminary colostomy was first performed and the rectum excised a few weeks later by the sacral route. The wound healed by first intention, and the drainage openings were completely closed at the end of the fifth week. I attribute the absence of fever after the operation, the general well-being of the patient, and the rapid healing mainly to the closure of the end of the divided bowel, but partly also to the daily irrigation with eusol of the large cavity left in the pelvis. Experience of rectal cases suggests the value of eusol in inoperable cases of carcinoma of the rectum after colostomy; also as a vaginal douche in inoperable cases of carcinoma of the cervix uteri and other septic conditions about the female genital passages.

Operation for Carcinoma of the Mamma.

Lieutenant-Colonel Caird's Case.

"Markedly septic case with foul odour. Huge fungating carcinoma of the mamma. Removal complete with glands. On the seventh day the discharge became very offensive and penetrating; eusol dressings were applied twice daily. On the second dressing all odour had gone, the discharge diminished and had practically ceased at the end of a week. Patient up on seventh day. Wound stationary for a time; a change to boric acid and red lotion at once hastened healing. Throughout the patient had no elevation of temperature or rise of pulse."

GENERAL CONCLUSION.

Further clinical experience of eusol in a great variety of cases has proved it to be a non-toxic, non-irritating, and efficient antiseptic. Nothing in this experience has been more striking than the fact that while it is highly destructive to bacteria it is non-toxic to the tissues. In eusol free hypochlorous acid is the most essential ingredient, but there is present also a sufficient quantity of biborate of calcium to give the solution a reaction alkaline to litmus. This feebly alkaline solution can be introduced into wounds or serous cavities with perfect safety. It can even be left in such cavities in quantity without any harmful effect. In lacerated and contused wounds, and in compound fractures, such as are met with in military practice, it is the most efficient antiseptic we possess.

It is most efficacious during the period of what might be termed progressive sepsis. Some surgeons have emphasised the benefit of modifying the treatment when sepsis is subsiding or has ceased. The granulations form after a period of two to three days, and rapidly cover the surface of the wound. Any tendency to superabundant growth of granulations and consequent delay in healing can be counteracted either by so applying the eusol that the serous discharge is reduced to a minimum and the wound is kept dry, or by discontinuing eusol and using other dressings appropriate for healing wounds. In any event the sepsis is by this stage completely under control.

The freedom which can be exercised in the application of eusol, and the rapid action which it has in arresting the sepsis and discharge of an infected wound, led to experiments on the effect of eusol on the blood. Following on this eusol was employed in the treatment of general septic toxæmia by intravenous injection.

This method was first made use of by Lorrain Smith, Ritchie and Rettie,[1] in a case of grave puerperal septicæmia, and the result was the recovery of the patient. They have applied the treatment in other similar conditions. In several cases toxæmia has been successfully overcome, and although such a result has not been uniformly attained, the safety of the method justifies its being applied in the diseases referred to in their preliminary communication. Intravenous injection has also been applied with success by Captain Fraser and Captain Bates in cases of acute toxæmia secondary to gas gangrene.[2]

Further research is now being carried out on the development of the subject foreshadowed by these investigations.

APPENDIX.

Some practical considerations remain. Hypochlorous acid is an extremely active bleaching agent, and it should therefore not be brought into contact with coloured fabrics. Further, if cloth is kept in the solution for some time its fibres are made brittle from destruction of the texture. Any towels, &c., which become wetted by the lotion should be forthwith rinsed in a large quantity of water to remove the acid as rapidly as may be. It also is corrosive to metals; instruments, needles, &c., should be carefully treated, else they will rust.

The lotion is exceedingly inexpensive. The ingredients are procurable everywhere at a slight cost, and the preparation is a very simple process. At the present time especially it will be found that the introduction of eusol will effect economy in the outlay for the treatment of septic wounds, a point of considerable importance, since phenol and its derivatives are becoming increasing difficult to procure.

Finally, it may be useful to set forth the details for preparing the antiseptic. Eupad powder is composed of equal weights of boric acid and bleaching powder. The boric acid is in sufficient excess to set free the hypochlorous acid in the solution. The bleaching powder should be dry and should contain 28 to 30 per cent. available chlorine.

The solution eusol is prepared as follows. Add to 1 litre of water 25 grammes of the powder; shake well and allow it to stand an hour; then filter. The clear solution is eusol, and contains about 0·5 per cent. hydrochlorous acid. If the bleaching powder is old or not up to the strength given above, use a larger quantity of the powder.

A rough-and-ready method of preparation is to add ½ oz. of the mixed powder to 1 pint of water; stir or shake and allow the sediment to settle.

In cold weather the solution will keep its strength for three weeks; in hot summer weather it loses its strength more rapidly, and should not be kept more than one week. It keeps best in bottles of coloured glass in a dark cupboard.

For use as a lotion the solution must be warmed. This may be done by placing the bottle in a basin of hot water, or the solution may be made double strength (50 grammes to the litre) and diluted with an equal volume of hot water. The double-strength solution will not keep its value for more than two days.

[1] Brit. Med. Jour., Nov. 13th, 1915. [2] Ibid., Jan. 15th, 1916.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 12, 1916.

Physical Treatment for Disabled Soldiers.

A QUITE serious problem which faces not merely the Army Medical Service, but the medical profession as a whole, is the relief of the injuries of warfare. Where these are actual wounds treatment is never considered complete until the wound has healed and the continuity of surface re-established. It seems sometimes as though too much thought is concentrated on the surface appearance of recovery, while the efficiency of the man as a worker depends rather on the function of the underlying structures of the locomotor system, the joints, and the muscles and tendons which move them. Where limbs are lost entirely, careful and ingenious measures have been applied to replace them and to perfect the substitutes. Where, however, stiffness and pain and disability remain in limbs which have been saved, men have been, and are still being, discharged from the services before these disabilities are entirely removed. We published last week a proposal[1] for the combined physical treatment of wounded and disabled soldiers which may prove to be the beginning of a great national scheme. The committee from whom this proposal emanates was appointed more than a year ago by the Balneological Section of the Royal Society of Medicine, and has had the advantage of the coöperation of the President of the Royal College of Physicians and of the Deputy Director-General of the Army Medical Service. We see here the beginning of a movement that may have far-reaching effects.

NAAMAN despised the use of water as a healing agent, and we to-day, in this country, seem sometimes to have a similar attitude, probably because the application of simple physical remedies to the cure of disease has been so often associated with conspicuous charlatanry. Yet it is droll that, in the country where water is so largely used as an agent of personal cleanliness, its other properties should be disregarded. Outside this country the medicinal value of baths is hardly a matter of dispute. Pfäfers alone—to name an instance—commands 100,000 such visitors annually. And the revival of the British spas now that the European ones are less accessible testifies to the existence of the need for hydrotherapy and its allied physical methods. It is an old observation that stiff limbs, otherwise intractable, can often be mobilised with comparative ease and without pain after preparation by moist heat. The work at the Grand Palais in Paris, which is summarised in the report of the committee of the Balneological Section of the Royal Society of Medicine, is now offering a concrete example of the application of such methods on a large scale to the special needs of the moment, and the results should be a matter for careful scrutiny. The committee which has studied this work is of opinion that an opportunity should be given in this country for an effective scheme of similar treatment in an institution devoted to the purpose. It is now for the medical profession as a whole to consider whether the claims made out for the movement by its sponsors are sufficiently well founded to warrant such a course. We think they are.

The details of such a scheme are of secondary importance. There need be no slavish imitation of the Grand Palais. The four component methods of a combined physical treatment are: (1) baths, warm or cold; (2) the application of dry heat, whether radiant or hot-air; (3) massage or mechanical mobilisation; (4) electricity. In the application of each of these much variety is possible. Under the first heading the "whirl" bath has been found of special value in Paris. It is probable that just as under the stimulus of competitive manufacture, improvements in artificial limbs and their application are, we learn, being evolved, so where the opportunity for the comparison of various bathing methods is offered a natural evolution of efficiency would occur. There may, for instance, be some difference of opinion as to the relative value of active and passive movements, and whether the latter can best be applied by a human agent or by apparatus of the Zander type. The Zander apparatus is unfamiliar in this country, but where it has been scientifically applied, as at the Edgar Allen Institute at Sheffield, it commands a considerable measure of support. Some who have seen these institutes at Stockholm and elsewhere have found them full of elderly individuals who take too much food and too little exercise, and for whom the Zander treatment provided an agreeable form of forced labour. The principal advantages of the Zander apparatus over the passive movements by a human agent seem to lie in the economy of personnel, the accuracy of dosage as regards time and number of movements, the exact amount of resistance applied which can only be accurately measured and graded by an apparatus. It thus would make for greater efficiency in so far as the movements prescribed by the experienced operator could be the more accurately dispensed. In actual practice the best result will emerge. It stands to reason, also, that there must be full opportunity for investigation of the condition which is being dealt with in each case if any of the methods of physical treatment are to be rationally applied; it must be possible to make an X ray examination, and if desirable to examine under an anæsthetic. Time must not be wasted in the physical treatment of cases of hopeless ankylosis or of small but painful adhesions which can be promptly cured by stretching under an

[1] THE LANCET, Feb. 5th, p. 311.

anæsthetic. All this seems to point to the justice of the conclusion that the combined physical treatment should be carried out in an institution specially devoted to it, and by a staff of the necessary experience.

Dentists and Military Service.

THE position of dentists in Lord DERBY'S scheme does not seem to be entirely satisfactory. Recently Mr. TENNANT was asked whether he was aware that local tribunals were refusing to exempt or to postpone to a later call dentists duly qualified. In his reply he stated that the cases were to be decided by local tribunals. This condition of affairs is unsatisfactory, inasmuch as there will be no conformity of treatment, the exemptions varying with each tribunal, and that variation being determined largely by the constitution of the tribunal. Surely some definite guiding rules should be issued, so that all could be dealt with on parallel, i.e., equitable, lines. It would have to be understood that the unregistered have no *locus standi*, and also the wants of districts must be carefully considered. Injustice may arise if those attached as civilian dentists are exempted on account of such appointments. Many of these appointments are purely local and have not been made after consideration of the position of other dentists in the same districts; and many of the individuals holding these appointments are of military age, and their work could quite easily be done by practitioners in the same district who are outside the scope of the group system. Still further, consideration must be given to those holding school appointments. The work done by these officials is of great national importance because they are making potential military efficients. There is no doubt that a large number of dentists of military age can be called to the colours without disorganising the civilian wants, but it is essential that those individuals should be used to supply the dental needs of the army and should not be utilised as combatant officers.

Mr. F. NEWLAND-PEDLEY'S letter in our issue of Jan. 29th is in this connexion worthy of the serious attention of the Army Medical Service. The organisation of the dental services in our army is most indifferent and this is in a large measure due to the fact that it is in the hands of officials who can possess no special knowledge of dentistry. The waste of public money over the treatment of the soldiers is well known, and has been mainly due to the fact that there has been no one in close touch with the authorities who possessed the necessary special knowledge. Recently dental inspectors have been appointed, but in many instances these have been young men who have not held responsible positions in dental institutions; these appointments are unsatisfactory in the sense that their holders may often be brought into contact with men more capable in their profession than they themselves can claim to be. There is no doubt that the dental services of the army would be far better carried out if the Army Medical Service would delegate the work to a medically and dentally qualified officer with the rank and position commensurate with the importance of the position.

There are proofs that unfamiliarity with the claims and achievements of modern dentistry prevails throughout the medical services. Medical officers of hospitals when dealing with cases of injury of the jaw too often omit to call in the aid of the dental surgeon, and many of our injured soldiers may have been doomed to permanent deformation of the jaw through this neglect. The Eastern Command has, we understand, organised at Croydon a special hospital for dealing with cases of injuries of the jaw, and the result has proved to be most satisfactory. If the Eastern Command can organise such a hospital why cannot the other commands do likewise? We think that there is an absolute necessity for grappling with the problem of fuller dental attention for the army, and public opinion is day by day becoming more and more alive to the necessity of the proper dental treatment of the troops. The modern medical man realises that the properly trained dental surgeon's opinion is worthy of respect and that it is impossible without special knowledge to deal rationally with the problems which must arise in connexion with dentistry. The services now command the activities of our leaders in every branch of medicine and pathology; we are certain that these officers would individually and collectively agree in the justice of the claim that the sailor and soldier should have the best dental aid.

Annotations.

"Ne quid nimis."

INOCULATION OF CIVILIANS AGAINST THE ENTERIC GROUP.

THE fact that so many soldiers are returning to this country convalescent or actually suffering from typhoid, paratyphoid A, or paratyphoid B naturally gives rise to an apprehension that some danger to civilians might thus occur. Hitherto there has been no evidence of this, but information has reached us that, at any rate in one district, there has been a rise in the notifications of the diseases coming under the enteric group, and in that district there are a number of soldiers recently returned from overseas. Every precaution has been taken by the military authorities to guard against infection and prevent carriers from mixing with the general population. No patient who has been diagnosed as suffering from one or more of these diseases is permitted to leave hospital until at least three negative bacteriological examinations have been made of the stools. There may be some cases, however, in which the disease has been so slight, owing to previous inoculation, that the man affected has not "reported sick," and so the disease has escaped detection; nevertheless, that man may possibly be a carrier. It is probable that

such cases are few. It behoves the sanitary authorities also to take all necessary precautions and to ensure that all cases occurring among civilians should be at once isolated, but it is not easy to ensure that all patients are dealt with in an early stage; it is possible that some of the cases are of the ambulatory form and so may not be diagnosed. Such difficulties, however, are met with at all times, and the question arises whether the risks now run by civilians in places where military hospitals are situated are such that preventive inoculation should be strongly advocated. Our attention has been drawn to an outbreak of typhoid and paratyphoid fever which has occurred in Reading, and our correspondent strongly urges preventive inoculation. There is no doubt of the success that has followed the inoculation of the troops, but they are exposed to much greater danger than are civilians in this country, owing to the possible contamination of the water-supply, and in warm countries, such as was the case in Gallipoli, by the food becoming infected by flies. It is well known that ordinary precautions as regards cleanliness taken by those in charge of the sick will go a long way towards prevention of infection, and it is probably only in the event of the water- or milk-supply becoming contaminated that a serious outbreak is likely. As far as the evidence goes at present we should not feel disposed to urge compulsory inoculation—such a proposal might be followed by an agitation which would be reflected among recruits; but that civilians should be *advised* to be inoculated against the enteric group is a proposition that might well be supported. The information in regard to Reading is the first instance reported to us of an outbreak possibly attributable to returned soldiers. More evidence would be required before any drastic steps could be taken by the sanitary authority with regard to the general population, but that inoculation might be a prudent step in those districts in which several cases have been notified amongst civilians cannot be denied.

THE ADMINISTRATION OF THE PHARMACY ACTS.

A SATISFACTORY statement in the annual report of the Pharmaceutical Society, which was presented to the Council of the Society at the February meeting, points to an increase in the number of names on the Register of chemists and druggists. A contrary experience would not have been surprising, since such large numbers of pharmaceutical apprentices and students have joined the army. But notwithstanding this fact nearly 1000 candidates entered for the qualifying examination last year, which is an increase of something like 15 per cent. on the previous year. It seems reasonable to assume that one of the causes of this increase was the desire on the part of students to obtain their qualification before joining the colours, and signs are not wanting that during the present and the next few years the number of candidates may be diminished to a material extent, for there is already a very heavy falling-off in students. A diminished Register may therefore be expected, but the reduction is not likely to be of such a serious nature as to cause public inconvenience, since the proportion of pharmacists to the population is now something like 1 to every 2000, a proportion which in some continental countries would be regarded as excessive. In any case the standard of the qualifying examination will not be lowered in order to enlarge the Register. The membership of the Society continues to grow, and now consists of almost exactly one-half the number of those eligible for membership, which, for a voluntary Society, may be considered satisfactory. Turning to the part of the report which deals with the administration of the penal clauses of the Pharmacy Acts, it is seen that the war has not interfered with the activity of the Society's law department, for over 1000 cases of alleged infringement were investigated and proceedings were instituted in no less than 300 cases, compared with 239 cases in the previous year. In the majority of instances the defendants were unqualified drug-store proprietors who had been usurping the functions of qualified pharmacists. It is clearly the view of the Pharmaceutical Society that it is just as necessary in war-time as in peace-time that the public should be protected from the danger involved by the indiscriminate selling of poisons.

THE TREATMENT OF PELLAGRA WITH SODIC CITRATE.

WE had occasion in 1914[1] to call attention to the researches of Dr. G. Alessandrini and Dr. A. Scala, showing that silica in a colloidal state produced in various animals an intoxication in which the clinical picture and pathological lesions corresponded completely to those of pellagra. These observers, moreover, demonstrated that by causing monkeys to drink the opalescent water of pellagrous districts, which is also drunk by the inhabitants, a similar intoxication results, They came to the conclusion that the cause of this disease was the silica, and probably also the silicates, existing in the drinking water in a state of solution or colloidal suspension. They added, however, that not all water which contained silica will cause this intoxication, since the silica is capable of forming, like the colloids, unstable combinations with the electrolytes, and these combinations may be innocuous. They said, further, that carbonate of calcium and the alkaline carbonates prevent the toxicity of the silica. Dr. Alessandrini and Dr. Scala now state in a further communication (*Il Policlinico*, Practical Section, Jan. 16th, 1916) that it is not sufficient to assert that their conclusions do not merit consideration simply because the cause of pellagra is incontrovertibly connected with the consumption of maize, every part of which has been minutely analysed and experimented upon, without giving the clear, striking, and broad results obtained by them in their experiments. Neither is it a valid objection which has been put forward by Sandwith that in Egypt, where pellagra is also found, there are no areas of silica, for the reason that the water of these localities has not been examined, and that it has never been denied that argillous strata exist in which the water lies which afterwards forms into springs and from which they may be contaminated. Besides, it is incredible to them that a desert soil like that of Egypt should be wanting in silica. In their former communication Dr. Alessandrini and Dr. Scala referred to ten cases of pellagra cured by intramuscular injections of sodic citrate, 1 c.c. of an aqueous solution of 10 per cent., leaving the patients in their original surroundings, at their ordinary occupation, and on their usual scanty diet. They have now collected a further number of cases from various parts of Italy treated in the same

[1] THE LANCET, Sept. 12th, 1914, p. 713; April 7th, 1915, p. 794.

manner. In 44 out of 50 thus treated excellent results were obtained, especially when it is noted that there was no other factor to cast doubt on the curative effect of the remedy. Of the remaining 6 cases, in 3 a marked improvement in the general condition was observed, although the cutaneous manifestations were but slightly improved. Of the other 3, only 1 could be said to give an entirely negative result, and in this chronic articular rheumatism and endocarditis existed, while another was of advanced age and was subjected to a limited number only of injections. The observers express the hope that extended trials will be given to this treatment, believing that, if the theory of the cause of pellagra is not recognised as proved, the benefit of the method will be more largely taken advantage of. Then, where possible, the drinking water of pellagrous districts will be purified.

THE REGULATION OF PROSTITUTION IN SWEDEN.

THE proposal in Sweden of a Royal Commission to abolish the regulation of prostitution by the police[1] has been investigated by the Swedish "Medicinalstyrelse," or Board of Health, and this department has solicited the opinions of various authorities throughout Sweden with the result that widely divergent views as to the efficacy of regulation appear to be held. Although the proposals of the Commission, which are antagonistic to regulation, are endorsed by most of the authorities consulted, only a minority unequivocally urge the total abolition of regulation. The authorities in favour of abolition have, in many cases, had considerable experience of regulation in the large towns which still countenance regulation, or, after having permitted it for some years, have abandoned it. Stockholm, Gothenburg, Norrköping, Christianstad, and Sundsvall still retain regulation, while Malmö, Helsingborg, Uppsala, Lund, Jönköping, Eskilstuna, and Falun have abandoned it. In Gothenburg, for example, the medical officer deputed to examine prostitutes, frankly states that he is unable to recommend the maintenance of regulation, whether it is made more stringent or more lenient. The many objections to regulation are, he says, certainly not outweighed by the relatively slight sanitary advantages of this measure. The sanitary authorities and the police of Malmö agree that the objections to regulation are so serious that abolition is practically inevitable. Regulation, it appears, was introduced in Malmö towards the end of the "eighties." Early in 1905 the police ceased to register new prostitutes, and early in 1908 the system was abolished, the vagrancy laws being applied in certain cases as a substitute. These changes were followed by a marked reduction of prostitution in the streets, but it is not possible exactly to estimate the extent to which the application of the vagrancy laws to prostitutes was responsible for this reduction. It is, however, certain that the vagrancy laws were far more effective and awe-inspiring when applied as a substitute for regulation than when treated as subsidiary to regulation. It was found from a modified form of notification of venereal disease obtaining in Malmö that its incidence fluctuated much from year to year in the period 1892–1913, but that the abolition of regulation was followed by an appreciable fall in the incidence of this disease. This fall may, it is admitted, have been due to other factors, but at any rate it shows that the abolition of regulation does not necessarily promote the spread of venereal disease, and that regulation, as far as Malmö is concerned, is far from necessary.

[1] THE LANCET, Jan. 8th, 1916, p. 89.

OCCUPATIONAL INJURIES DUE TO RADIUM.

IN the *Journal of the American Medical Association* of Jan. 1st Professor T. Ordway, of Albany Medical College, has described the effects observed during a year's radium work at the Huntington Hospital. Those who were applying radium in the treatment of patients noticed after a few weeks a slight though gradually increasing sensory disturbance in the finger-tips, particularly on the ulnar side of the first phalanx of the thumb and the radial side of the terminal phalanges of the index and middle fingers of each hand. These symptoms began insidiously and consisted of blunting of sensibility of the finger-tips, increased sensitiveness to heat and pressure, amounting at times to pain, and anæsthesia of varying degrees. They were out of proportion to the objective changes, which consisted of flattening of the natural ridges on the affected fingers with consequent changes in the finger prints, thickening of the horny layer of the epidermis with scaling, failure of the finger-tips to resume their normal shape after pressure, a sort of pitting and upgrowth of the cuticle at the base of and underneath the nails, which became extremely brittle and tended to stand off from the fingers. The assistants and nurses were warned of the dangers and told not to handle the emanation tubes with the fingers but to use forceps. But some handling is unavoidable. For example, a medical practitioner began making routine applications of radium early in November, 1913. These increased in number until the latter part of January, 1914, after which they were few. After some weeks the tips of the thumbs, particularly towards the ulnar side, and of the fore and middle fingers, especially towards the radial side, gradually became numb and deficient in sensibility. There was greatly increased sensitiveness to heat, paræsthesia in the form of a peculiar feeling in the finger-tips, and awkwardness in delicate manipulations. Small objects were frequently dropped and there was difficulty in taking pulses. The affected portion of the fingers became smooth and shiny and the ridges almost obliterated. Later the epidermis became thickened, dry, and parchment-like, and on pressure the finger-tips remained indented for some seconds. The thickened horny layer became wrinkled and cracked and desquamated. The nails stood off from the flesh of the fingers and there was a tendency to the upgrowth of tissue beneath the nail. At present, although the patient has handled radium for therapeutic application only occasionally for almost a year, the dryness, partial anæsthesia, and slight tenderness of the finger-tips persist. Changes in the blood of radium workers have been described by Gudzent and Halberstaedter —relative and absolute increase of lymphocytes and relative and absolute decrease in neutrophiles. These were also observed by Professor Ordway. Various general symptoms, such as headache, malaise, weakness, unusual need of sleep, irritability, and disorders of menstruation, have been described, but it is doubtful whether they are due to the radium or to other causes, such as close confinement and tiring routine. To prevent these effects Professor Ordway advises that in the

application of radium there should be a rotation of the staff, and affected persons should at least temporarily abandon the work. Protection should be given as far as possible by screens in the form of boxes or plates about the radium. The operating-rooms should be well ventilated, particularly if any radium emanation is present.

JUVENILE CRIME.

THERE is no need to dilate upon the many enactments for the welfare of our children recently placed on the Statute-book. Some of these have now been in operation long enough to yield a good result, but the outbreak of war appears to have had a contrary effect. A boy, aged 10, and his brother, aged 8, were charged at Leicester recently with setting fire to a council school. The boys when arrested admitted that they wished to burn the school down. Such a story points to a wave of lawlessness which can be noted among children, not in isolated parts of the country, but in all directions, and the connexion of this juvenile anarchy with the circumstances of the country in time of war may be presumed. It can only be presumed as the figures for 1915 are not yet available, and those for 1914, which have just been issued, can only have been influenced to a minor degree by the war. But these show that we have very inflammable material to deal with. In juvenile courts 14,845 children were charged in 1914 with indictable offences. This figure is 500 more than in 1913. Of non-indictable offences, no fewer than 22,084 children were charged, making a total of 36,929, made up of 35,080 boys and 1849 girls. Peace-time or war-time these figures are appalling enough. It will be noted that they include a period of four months of war, and judging from the experiences in towns and country districts up and down the country the figures for 1915 will show a still greater increase in juvenile crime. Various reasons are combining to promote lawlessness among children. The absence of fathers from home, the general unrest, the absorption of teachers in other things than pedagogy, and lastly, the picture palaces. From a medico-legal point of view, we are not sure that these places are sufficiently scrutinised. Certain films appear designed to stir the love of danger among children in a most unfortunate way. The children give immediate rein, oftentime in reckless and wanton bravado, to forms of emotion which find vent in crime. Local authorities would do well to press for greater control over picture palaces, somewhat on the lines of what has been adopted in Liverpool, and, maybe, elsewhere—namely, day performances consisting of films of an educational or harmless character and approved of by the education authority, and the exclusion of children from evening performances, unless accompanied by parents or other adults. Government intervention may otherwise be necessary.

A LEECH IN THE NASAL CAVITY.

IT is apparently a well-recognised fact that, amongst the warmer countries skirting the Mediterranean Sea, leeches commonly gain access to the human body. Usually they are ingested with drinking water, surface or well water being both potential harbourers of the leech. When ingested it is of so small a size that it readily avoids detection, especially when water is drunk at night. It is said that the inhabitants avoid the possibility of swallowing the leech by drinking from the cupped hand. Horses as well as men are attacked. An instance of a soldier harbouring a leech is reported by Dr. S. F. Harmer in the *Journal of the Royal Naval Medical Service* for January. The patient was recovering from a shell wound when he began to suffer from headaches, frequent nose-bleeding, and gastric pains. At one time typhoid was suspected. In this state he remained for some time until he came to England, passing through a phase of double tertian malaria in the meantime. Three days after his return the leech was seen by the nurse in the nostril and removed. The patient rapidly recovered. The length of the animal was three and a half inches. The favourite habitat is the posterior nares behind the soft palate, but they may gain the region of the larynx. The bleeding they induce may even be fatal. It is probable that more instances of this character may be forthcoming, and any persistent bleeding from the upper respiratory passages should stimulate a search for this animal.

THE SALE OF LAUDANUM.

THE Council of the Pharmaceutical Society, at their February meeting, passed a resolution in the form required by statute, declaring that preparations of opium containing 0·75 per cent. of morphine ought to be added to Part I. of the Poison Schedule. The resolution was in the following terms:—

> That by virtue and in exercise of the powers vested in the Council of the Pharmaceutical Society of Great Britain by the Pharmacy Act, 1868, as amended by the Poisons and Pharmacy Act, 1908, the said Council does hereby resolve and declare that the article in Part I. of the Schedule to the last-named Act, "opium and all preparations or admixtures containing 1 or more per cent. of morphine" ought to be removed therefrom, and that the article, "opium and all preparations or admixtures containing 0·75 per cent. of morphine," ought to be added thereto.

This resolution will bring the "laudanum" of the British Pharmacopœia, 1898, into the first part of the Poison Schedule. In view of the known attitude of the Privy Council in relation to this matter, there can be no doubt that the Pharmaceutical Society's recommendation will be approved and gazetted in due course. The steps that have led up to this action have already been recorded in THE LANCET, and it is satisfactory to know that the Pharmaceutical Society has taken what is undoubtedly the proper course.

DEATHS OF AMERICAN MEDICAL MEN IN 1915.

THE New Year number of the *Journal of the American Medical Association* gives its usual annual summary of the deaths of medical men in the United States and Canada. Based on a conservative estimate of 156,000 practitioners, the annual death-rate was 15·71 per 1000, being exactly the average for the last 14 years. The chief causes of death in the order named were the same as for the previous year—viz., senility (400), heart disease (218), cerebral hæmorrhage (218), pneumonia (154), accident (104), and nephritis (90). The average age at death was a little over 59; 212 deaths occurred between 81 and 90, 30 between 91 and 100, while one physician attained the age of 102 years. The average number of years of practice was 32½. The causes assigned for the deaths from accident were: automobile, 23; falls and drowning, each 16 (of the latter, 5 were drowned in attempting to save lives); poison, 11; automobile and railway accidents, each 10; burns, 4; firearms and by injuries from animals,

each 2; and asphyxiation, sunstroke, privation, lightning, and explosion, 1 each. The 44 doctors who ended their lives by suicide selected the following methods: Firearms, 17; poison, 15: cutting instruments, 5; cause not stated, 3; strangulation, 2; and asphyxiation and jumping from a high place, each 1. Of the 21 homicides, 18 were due to firearms, 1 to hanging, and 2 to other means, and of these deaths 7 occurred in feuds or affrays. Two medical men died in prison, and 9 lost their lives either in battle on land or by the sinking of ships on which they were medical officers. Concerning the civil positions of those who died, 1 had been a member of Congress, 2 governors of states, 4 United States consuls, 11 members of State senates, 39 members of the lower houses of legislatures; 35 had been mayors, 33 aldermen, 52 had served as justices of the peace, as clerks in the government service, or in various other civil positions; 15 had been postmasters; 24 editors of medical or lay journals; 19 had been clergymen, of whom 4 were foreign missionaries; 4 had been attorneys; 107 druggists; 40 bankers; 16 medical directors of life insurance companies; 10 dentists; 3 presidents of railway companies; 6 surgeons on steamships; and 4 chemists. The labour of compiling such a summary must be very considerable, and we are indebted to the American Medical Association for the interesting light which it throws on the career of the medical practitioner on the other side of the Atlantic. Violent death, whether self-inflicted or from without, is startlingly frequent, and in the opposite sense, death from old age shows a higher figure than might have been expected. The variety of civil position is also worthy of note. No such figures are available in this country, and an overworked Registrar-General's staff could hardly be asked to supply them at the present time. But we should expect to find that the medical man in this country leads, on the average, a more strictly professional life than his colleagues across the water, dies much less often from violence, but more rarely reaches the quiet cessation of his activities in an extreme old age.

IT is the intention of the Queen to unveil the memorial to Florence Nightingale in the crypt of St. Paul's Cathedral on Monday next, Feb. 14th. The memorial has been erected by the sculptor, Mr. Arthur G. Walker.

Professor Arthur Keith is giving a course of lectures on the Anatomy of the Human Body for first-aid and ambulance students in the theatre of the Royal College of Surgeons, Lincoln's Inn-fields, at 5.30 P.M., on Mondays, Wednesdays, and Fridays, from Feb. 14th to May 5th. Illustrative anatomical specimens will be on exhibition in the theatre from 4–7 P.M. on each lecture day, and from 10 A.M. to 5 P.M. on the succeeding day in the hall of the museum.

AT the Section of Odontology of the Royal Society of Medicine a debate will be held on Monday, Feb. 28th, at 5.30 P.M., to discuss War Injuries of the Jaws. An exhibition of dental splints and other apparatus illustrating the subject will be open from Tuesday, Feb. 22nd, to Monday, Feb. 28th, between 11 and 6.30. Anyone wishing to exhibit is asked to communicate with the honorary secretary by the 14th instant. Members of the Section of Surgery are specially invited to the debate.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

The Midwives (Scotland) Act, 1915: The Central Midwives Board for Scotland.

THE Central Midwives Board for Scotland has been provisionally constituted as follows, the appointing body being added to the names in brackets: Sir Archibald Buchan-Hepburn (Association of County Councils for Scotland), Sir Robert Kirk Inches (Convention of the Royal Burghs of Scotland), The Lady Susan Gordon-Gilmour (Queen Victoria Jubilee Institute for Nurses: Scottish Branch), Dr. Archibald Campbell Munro (Society of Medical Officers of Health of Scotland), Professor Sir John Halliday Croom (University Courts of the Universities of Edinburgh and St. Andrews, conjointly), Professor Murdoch Cameron (University Courts of the Universities of Glasgow and Aberdeen, conjointly), Dr. James Haig Ferguson (Royal College of Physicians of Edinburgh, Royal College of Surgeons of Edinburgh, and Royal Faculty of Physicians and Surgeons of Glasgow, conjointly), and Dr. Michael Dewar and Dr. John Wishart Kerr (Scottish Committee of British Medical Association). The Lord President of the Council can nominate three members of the Board, but as yet has appointed only Lady Balfour of Burleigh.

The Local Government Board of Scotland has issued a circular to the local authorities calling their attention to those provisions of the Midwives (Scotland) Act which directly affect them. The circular gives a summary of the local authority's duties of superintendence and supervision under sections 16 and 17, and points out that it may delegate its powers and duties to a committee; it also calls attention to the obligation likely to be laid upon such authorities to contribute to the general expenses of the Central Midwives Board when the fees payable by candidates for registration prove insufficient for the purpose. One of the provisions of immediate interest to which attention is directed is that by which local supervising authorities are authorised to contribute towards the training of midwives within or without their respective areas in such manner and to such extent as may be approved by the Local Government Board.

Edinburgh University Court.

At a recent court of Edinburgh University, on the recommendation of the Senatus, it was resolved that students who had attested and had been accepted for military service, and who had completed five terms of study of anatomy, should be permitted to appear for the professional examination in anatomy in March next. It was resolved also that, for the present year, students who commenced medical study in winter, and who are now in their third year, should be allowed to appear for examination in March next, instead of in the following July. It was intimated that the sum of £237 has been received from the Scottish Association for the Medical Education of Women for the purpose of founding a prize for women medical students. The precise conditions of award will be announced later. The following additional examiners were appointed: Dr. George Pratt Yule, Medical Officer of Health, Fifeshire (Public Health Laboratory Work); Professor H. R. Dean, Victoria University of Manchester (Pathology); Dr. W. G. Aitchison Robertson (Forensic Medicine); Dr. Charles Porter, Medical Officer of Health,

Marylebone (Public Health, &c.); and Dr. George F. Barbour Simpson (Midwifery).

Edinburgh Insurance Committee.

At a meeting of the Administration Subcommittee of the Edinburgh Insurance Committee the clerk submitted a statement of payments to doctors and chemists during the year 1915. The payments to doctors amounted to £25,448 10*s.* 8*d.*, as against £30,802 3*s.* 2*d.* during 1914. The payments for the year 1915 were by way of an advance at the rate of 1*s.* 4*d.* per person on each doctor's list, pending an adjustment of the lists as regards persons who have joined H.M. Forces and are no longer entitled to medical benefit. The payments to chemists for supply of drugs, medicines, &c., during 1915 amounted to £5823 14*s.* 5½*d.*, as against £6898 2*s.* 6*d.* for 1914. The amounts paid for October, November, and December, 1915, represent 90 per cent. of amounts claimed, 10 per cent. having been retained pending a complete check of the prescription forms for these months. The list of doctors under agreement with the Edinburgh Insurance Committee as revised in January numbers 119. There are 108 chemists and dealers in appliances, and half-a-dozen dealers in prescribed appliances only.

The Royal Public Dispensary, Edinburgh.

The annual meeting in connexion with the Royal Public Dispensary of Edinburgh was held in the City Chambers on Jan. 29th, Lord Provost Sir Robert Inches presiding. Mr. R. C. Gray, S.S.C., the honorary secretary, submitted the annual report of the managers, which stated that the past year was the 139th of the history of the dispensary, and that even in the special and trying conditions the institution continued to do much good work among the suffering poor and to maintain its place among the charities of the city. The dispensary provided advice, medicines, and surgical appliances and assistance, all free of charge, and the number who had been relieved during the past year is 3241, those who had been attended at their own homes 1420. The operation of the Insurance Act, as was to be expected, had affected the number of adult working men who applied to the institution; but another cause of the diminution of the numbers was the impossibility of maintaining the normal attendance of the medical staff at the present time. Six out of the eight ordinary physicians are absent on active service. The managers felt that special acknowledgment was due to Dr. J. G. Cattanach and Dr. G. D. Mathewson and also to Dr. A. B. Darling, who, with the assistance of medical students, had done their utmost to give attention and care to the patients.

Medical Service for Highlands and Islands.

In a large number of northern parishes medical practitioners have concluded agreements with the Highlands and Islands Medical Service Board, under which they will give medical attendance to the families and dependants of insured persons, uninsured persons of the crofter and cottar class, with their families and dependants, and others in similar circumstances who would find an ordinary fee for medical attendance too heavy for them. The arrangement is that the doctors shall charge these persons a sum not exceeding 5*s.* for first visit and 2*s.* 6*d.* for each succeeding visit in the same illness, the distance of the patient's house from the doctor's making no difference to the fee. An additional moderate fee is chargeable when the practitioner supplies the medicine. The midwifery fee, including fees for subsequent visits if necessary, has been fixed at £1. The board has issued for use in the various districts under its jurisdiction notices which can be used as posters explanatory of its objects and scope. Under the explanatory paragraphs, which are, of course, of general application, is printed a schedule giving the names of the medical men whose services are to be had in the particular district for which the notice is intended, together with the area within which they have agreed to give attendance.

Feb. 7th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

The Gratitude of a Board of Guardians.

SOME weeks ago the Enniscorthy guardians granted to Mr. T. J. Kelly, one of their medical officers, on his retirement a superannuation allowance of £100 a year. He had spent 38 years in their service. Mr. Kelly wrote to the Local Government Board, pointing out that he had not been granted the full allowance to which he considered himself entitled. The guardians, taking umbrage at his action, thereupon rescinded their previous resolution and fixed his retiring allowance at £50 per annum. The decision was declaredly made, in the words of the guardian who moved the resolution, "to punish the doctor for writing to the Local Government Board." The incident is illustrative of the unfortunate position of the Poor-law medical officer as regards retiring allowance in that he is entirely dependent on the will of the guardians.

A Medical Mayor.

Mr. J. J. O'Sullivan, L.R.C.S.Irel., has been elected Mayor of Waterford. He has been for some time an alderman of that city, and has filled the office of High Sheriff. Mr. O'Sullivan is an active member of the Irish Medical Committee, and an examiner at the Apothecaries' Hall.

The Forster Green Hospital, Belfast.

At the annual meeting of the friends of this hospital, held on Jan. 25th, it was reported that 237 patients were treated during the year 1915, as against 323 in 1914. On the other hand, the average period of treatment was 20·5 weeks as against 13·49 weeks in 1914. It is interesting to note that while the subscriptions were a few pounds down, the total amount in the household expenses (despite the increase of prices) was increased by only £120 upon an expenditure of £2500. It is proposed to pay off £672 of the building debt instead of £1000. One of the clerical speakers criticised the city corporation of Belfast for a very serious omission in their tuberculosis scheme in failing to provide for the inspection of schools, which, he said, in Belfast were "hot-beds of disease, and they would never get this scourge (consumption) under control until they adopted a system of school medical inspection." School medical inspection is, however, likely to be inadequately performed during the war.

The Belfast Hospital for Sick Children.

At the annual meeting of the supporters of this charity, held on Jan. 27th, the report presented by the medical staff showed that 631 intern and 4034 extern cases were treated during 1915. The clinics are being largely attended by senior medical students. The financial statement indicated that

while the total income was £2712 19*s*., the expenditure was £1872 8*s*. 3*d*., which is only about £1 more than in 1914.

Windfall for Bangor, Co. Down.

Mr. W. K. Crosby, born in Bangor, and now a prosperous American citizen, has given £5,200, to be divided as follows: £3000 for the endowed school, £2000 for the hospital, and £200 for the town library. Bangor was one of the first seats of learning in Ireland, an abbey and ecclesiastical colony having been founded there early in the sixth century by St. Comgall; and from this centre of education, where there were in early times a great number of students, missionaries went out to propagandise among the Pagans and to encourage the early Christians. The original antiphonary of the old abbey is at present in Milan.

Feb. 7th.

AN OUTBREAK OF DIARRHŒA ASSOCIATED WITH POLLUTION OF THE PUBLIC WATER-SUPPLY.[1]

AN extensive outbreak of diarrhœa in the Blackwell rural district, Derbyshire, was investigated recently by Dr. Morgan J. Rees, one of the medical inspectors of the Local Government Board, whose report is of a very interesting nature. At the commencement of the epidemic it was thought that the symptoms from which the patients suffered might be due to the gastro-enteric form of influenza or to food poisoning. The very large number of persons who were simultaneously attacked rendered the former hypothesis unlikely, while, were the latter to be entertained, it was obvious that some article of almost universal consumption would require to have been inculpated, and no food used locally was found to be so consumed. Careful inquiry excluded milk, shell-fish, and other articles of food as possible causes of the outbreak. Finally, suspicion fell on the water-supply, as it was noted that the vast majority of persons attacked by diarrhœa resided in the Blackwell and South Normanton parishes, while the inhabitants of other parts of the district were practically exempt. The two parishes just mentioned have a common water-supply, which is distinct from that of the remainder of the district, and is derived from a service reservoir at Huthwaite. Thus the diarrhœa area and the Huthwaite water area seemed to coincide, and subsequent detailed inquiries firmly established the relationship between the two. It was found on bacteriological investigation that while the water in the Huthwaite reservoir was free from B. coli, water drawn from household taps in the affected parishes contained that organism. It was therefore conjectured that sewage had gained entrance to the water main at a point between the reservoir and the boundary of Blackwell rural district, and an attempt was made to try to discover the manner in which such pollution had taken place.

It should be stated that the epidemic commenced in the first week of March, was at its height in the third week, after which it declined. On March 19th a sewer which crosses over the main conveying water from the Huthwaite reservoir to the affected parishes was found to be fractured. It was broken for a distance of some 16 feet and had apparently been in this condition for a considerable period, as sewage was intimately mixed with the surrounding clay. The water-supply throughout the whole of the two affected parishes was cut off for two days, and the repair of the sewer coupled with the cutting off of the water brought the epidemic practically to an end. The defect in the water main which had permitted the entrance of sewage still remained to be discovered. The main was accordingly tested by means of meter readings and was found to be sound. On making further inquiry, however, Dr. Rees discovered a by-pass, the existence of which had been almost forgotten, connecting the inlet of the reservoir at a high level with the outlet main which emerged from the reservoir at a low level. On excavation of the ground the by-pass was found to be made of 6-inch cast-iron pipes. In the upper half of its course it was above the level of the sewer that had been fractured, while in the lower it was below the level of the sewer. The valve connecting the by-pass with the inlet pipe to the reservoir was closed, effectually preventing water passing directly from the inlet to the outlet main without first passing through the reservoir, but the other end of the by-pass where it joined the outlet main was open, so that water could rise and fall in the lower portion of the by-pass, such fluctuations being governed by the level of the water in the reservoir. The reservoir has a capacity of 100,000 gallons, which is sufficient for one day's supply. When the by-pass was first exposed no leakage was detected, but later in the day, when after some hours of pumping the reservoir was nearly full, water escaped freely from a hole in the collar of one of the joints situated at a distance of only 2 feet from one of the pipes of the sewer which had been broken, while immediately around the joint black sludge was found mixed with the clay. The hole in the cast-iron pipe, known technically as a sand-hole, was due to a defect in the casting. The rising and falling of the water in the by-pass would afford ideal conditions for insuction, and the sand-hole would give ready entrance to the sewage in the surrounding soil.

The Nature of the Outbreak

As the illness was not notifiable it was difficult to form an exact estimate of the number of persons who were attacked or to ascertain with any degree of accuracy the dates of the onset of illness or the age and sex distribution. In Dr. Rees's opinion, however, it is probable that some 1700 persons suffered from diarrhœa. The incubation period could be conjectured in only a few of the cases. A man returned to Blackwell on March 13th after an absence of several weeks. He was taken ill with diarrhœa on March 15th. Another man, living outside the affected area, drank the implicated water for the first time on March 26th. About 10 o'clock the same night he was attacked by diarrhœa and was away from work for several days. In a third instance water taken for the first time on March 22nd caused symptoms of diarrhœa on the night of the 23rd.

As regards symptoms the onset was generally sudden and accompanied by headache, nausea, pains in the abdomen and back, cramps in the legs, and diarrhœa. The patients often complained of "shivers" or rigors in the early stages. In mild cases the diarrhœa lasted for one day, but in the severe cases it persisted for a longer period and was profuse and frequent, a condition amounting to collapse being produced. Sometimes these symptoms were succeeded by lassitude and headache, accompanied by depression. As a rule, these symptoms persisted for a period ranging from 10 days to a fortnight, during which the patient felt disinclined for work. Beyond the existence of rigors at the onset there is no evidence to indicate that the illness was accompanied by rise of temperature. The physical signs generally noticed were a dirty mouth and a furred tongue, tenderness of the abdomen, and gurgling of the bowel on palpation. The spleen and liver were not palpable. No spots were observed. In the chest the signs appeared normal. In a few cases relapses occurred, and they were generally not less severe than the primary attack. As far as was known by the medical men practising in the district no deaths attributable to the diarrhœa occurred.

During the period of the outbreak 6 cases of enteric fever were notified. It is probable that only 4 of these really had the disease. Of these 4, one died and no history could be obtained; another probably contracted the disease by eating mussels, while in the case of the remaining 2 the source of infection was not discovered, but the clinical features of their illness differed greatly from those observed in the patients suffering from diarrhœa.

Bacteriological investigation was undertaken by Dr. J. C. G. Ledingham, of the Lister Institute, at a time when the outbreak was subsiding. Fifteen cases were made the subject of investigation. Specimens of fæces from 12 of these were examined, the B typhosus being isolated from 2, the B. typhosus and the B. dysenteriæ "Y" from 1, the B. dysenteriæ "Y" alone from 1, while the remaining 8 were found negative for typhoid and dysentery. Specimens of urine from 7 patients were examined and all found

[1] Dr. Morgan J. Rees's Report to the Local Government Board on an Outbreak of Diarrhœa in the Parishes of Blackwell and South Normanton in the Blackwell Rural District, associated with Pollution of the Public Water-supply. London: Wyman and Sons, Limited. Price 6*d*.

sterile. The blood from 13 cases was investigated: 12 of these gave a typhoid Widal and a dysentery Widal, while 1 gave a typhoid Widal alone.

The results of bacteriological research are often difficult to interpret, and it is not easy to estimate the significance of those given above. Unfortunately, neither Dr. Ledingham nor Dr. Rees expresses an opinion on the subject. Are we to conclude that the symptoms suffered by those attacked were produced by either the B. typhosus or the B. dysenteriæ "Y," or by both of these combined? The symptoms and physical signs, as described by Dr. Rees, do not suggest that the patients suffered from either typhoid fever or dysentery, and it seems, in our opinion, more probable that the symptoms were due to ingestion of the ordinary sewage bacteria. If this hypothesis be correct, the epidemic is a very striking one, and goes far to prove the fact, which is often lost sight of, that sewage-polluted water may give rise to severe illness even though the specific organism of enteric fever is not present.

ASYLUM REPORTS.

West Riding Asylum, Wakefield (Annual Report for the Year 1914).—The total number of cases under treatment during the year was 2468, the average daily number resident being 2130. There were 338 direct admissions and 26 transfers. The number of patients discharged was 171, with a recovery rate of 37·36 per cent. based on the direct admissions. There were 183 deaths, making a death-rate of 8·59 per cent. of the average daily number resident. General paralysis was the principal cause of death in 44 cases, and tuberculosis in 24. Dr. J. S. Bolton, the medical superintendent, states that after an experience of several years he is convinced that tent life is much more healthy and agreeable than the modified and partial out-door treatment which is attained by the employment of permanent verandahs and shelters; and that the general use of inexpensive out-door tables and forms, which enables meals to be provided out-of-doors for the whole of the patients in the institution, not only greatly improves the health and adds to the comfort of the inmates and staff, but also simplifies the administration and adds to the general hygiene of the wards. In this asylum the wards are little used during the greater part of the year except for sleeping purposes. With regard to the research work carried out in the pathological laboratory, Dr. Bolton has recently completed a work on "The Brain in Health and Disease," and has also, in conjunction with Dr. W. Robinson, finished the systematic examination of the brain in a case of long-standing permanent blindness in which central vision had been largely regained. Dr. H. Devine during the year published papers on two subjects—namely, the Clinical Significance of Katatonic Symptoms and the Biological Significance of Delusions. Dr. Robinson published a paper on Some Doubtful Cases of So-called General Paralysis of the Insane, and Mr. H. S. Gettings and Dr. Ethel Waldron published a paper on the Detection of a Dysentery Carrier.—At Stanley Hall 6 new cases of imbecile boys were admitted during the year. One of these, together with 5 old cases, was sent to the chronic block. Of the 5 other admissions, 2 attended school, 2 were unfit, and 1 was too young. The number of boys on the school register was 28, with an average daily attendance of 26. The girls, unfortunately, continued to be scattered throughout the female wards.

Hereford County and City Lunatic Asylum (Annual Report for the Year ending March 31st, 1915).—The total number of cases under treatment during the year was 603, the average daily number resident being 520. The total number of patients admitted for the year 1914 was 85, of whom 12 were transferred from other asylums. The prevalent forms of mental disorder in the direct admissions were: Mania, 20; melancholia, 8; dementia, 11; delusional insanity, 8; epileptic insanity, 1; confusional states, 5; imbecility, 14; stupor, 4; general paralysis of the insane, 2. Of the chief causative factors alcoholism was assigned in 9 cases, syphilis in 7, and neurotic and neuropathic heredity in 35. It is noteworthy in what a large percentage of cases in which accurate information had been obtained insane heredity and congenital mental defect were found to be the dominating factor determining the issue. There has always been in residence a larger ratio of related patients in this asylum than in most county asylums. The discharges numbered 26, with a recovery rate, calculated on the direct admissions, of 17·8 per cent. There were 38 deaths, making a mortality of 7·3 per cent., based on the daily average number resident. Senile decay was the cause of death in 13 cases, tuberculosis in 5, general paralysis of the insane in 1, and chronic Bright's disease in 7. A post-mortem examination was performed in 76·3 per cent. of the cases.

Govan District Asylum, Cardonald, Glasgow (Annual Report for the Year ending May 14th, 1915).—The total number of cases under treatment during the year was 935, the daily average number resident being 665·6. There were admitted in all 280 patients, and there were discharged 132, of whom 80 were recovered. The percentage of recoveries to the total admissions was 28·5. One male patient was discharged recovered after having been under treatment for 19 years. The deaths were at the rate of 16·3 per cent. of the average daily number resident, and numbered 109. Of these, 60 were due to diseases of the nervous system (including 26 due to general paralysis of the insane), 8 to heart disease, 8 to lung disease, 5 to abdominal disease, 6 to old age, and 22 to various general diseases. Of the patients admitted 70·7 per cent. were in a weak state of health, and many were suffering from the terminal stage of bodily diseases. Alcoholic excess was an important causative factor in 21 per cent. of the men and 5·9 per cent. of the women. General paralysis was present in 17·9 per cent. of the men and 4·2 per cent. of the women. With regard to the influence of the war on the number of admissions, the number admitted for the period of the war under review was less than for corresponding periods of previous years, and in no single case could it be said that the war played the principal rôle in the causation of the mental disorder.

The Coppice Mental Hospital for the County and City of Nottingham (Annual Report for the Year 1914).—The total number of cases under treatment during the year was 128, of whom 7 were voluntary boarders. The average daily number resident was 93. The admissions amounted to 28, which was the largest number for any year since 1899. Many applications for admission to the female side had to be refused, as there were no vacancies. In addition to the 28 admissions, 2 men and 5 women were admitted as voluntary boarders without certificates. The chief forms of mental disorder in the admissions were as follows: 7 suffered from forms of mania or mental exaltation; 4 from melancholia; 6 from confusional states; 6 from primary dementia; and 3 from general paralysis of the insane. The prospects of recovery were regarded as fair in 14 of the admissions. 25 per cent. of the cases admitted were ascertained to have a definite family history of insanity or other allied neurosis. 20 patients were discharged, yielding the good percentage of 50 on the direct admissions. The duration of the attack in the recovered cases varied from 2 to 14 months, and in 10 of the 11 the duration was less than 12 months. There were 8 deaths, making a death-rate of 8·59 per cent. of the average number resident. The new shelter for open-air treatment proved very useful in acute cases, and gave most beneficial results in the subduing of excitement and the inducing of sleep and appetite.

Waterford District Lunatic Asylum (Annual Report for the Year 1914).—The total number of cases under treatment during the year was 709, the daily average number resident being 642. The admissions numbered 67, and were 2 more than in 1913, which was the lowest number for 30 years. The varieties of mental disease were as follows: Mania, 30 cases; melancholia, 11; delusional insanity, 10; congenital mental deficiency, 4; insanity with epilepsy, 1; insanity with gross brain lesion, 1; dementia, 6. Four persons were not insane on admission. The principal causes of mental breakdown were in the following order of frequency: Hereditary predisposition, 29 cases; mental stress or worry, 18; alcoholic cases, 11; mental deficiency, 6. The discharges numbered 36—25 males and 11 females. Of these, 18 males and 6 females were recovered. The recovery rate, calculated on the total number admitted, was 35·8 per cent., being 3·5 per cent. more than the previous year. There were 31 deaths, 9 more than in 1913. The mortality rate, calculated on the daily average number resident, was 4·8 per cent. This was 1·3 per cent. more than in 1913, but was still much below the average death-rate in the other Irish asylums—viz., 7·2 per cent.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

THE following appointments have been notified:—Surgeons: K. H. Hale to the *Maidstone*, and L. B. Stringer (temp.) to the *Victory*, for Haslar Hospital. Temporary Surgeons: T. Beaton to the *Pembroke*, additional, for Chatham Hospital; H. S. Sington to the *Pembroke*; C. E. Kindersley to the *Victory*; F. L. Cassidi to the *Vivid*, all additional, for Chatham, Haslar, and Plymouth Hospitals, respectively; and H. E. Hewat to the *Euryal*.

ARMY MEDICAL SERVICE.

Lieutenant-Colonel C. W. Profeit to be temporary Colonel whilst an Assistant Director of Medical Services.

ROYAL ARMY MEDICAL CORPS.

The undermentioned Majors are retained on the Active List and to be supernumerary: E. E. Powell and W. A. S. J. Graham.

The undermentioned temporary Captains relinquish their commissions: E. L. Middleton, J. Ewing, and H. Munro.

The undermentioned to be temporary Captains: Captain B. G. Elliott, The East Lancashire Regiment, Territorial Force, Captain J. M. D. Scott, South African Medical Corps, Temporary Lieutenant R. B. Taylor, Temporary Captain S. J. Scott, from Princess Victoria's (Royal Irish Fusiliers) G. Graham, L. F. Jones, C.A.M.C., and J. A. Hunt, C.A.M.C.

The undermentioned temporary Lieutenants to be temporary Captains:—J. D. Finlay, W. Winslow, A. C. D. Firth, C. H. Philips, T. J. Kelly, C. J. H. Sharp, C. F. O. White, E. S. Dixon, W. Pritchard-Airey, J. Morrison, J. C. Dunn, W. C. S. Wood, D. Watson, G. A. Maling, V.C., L. A. P. Burt, S. R. Mackenzie, A. Ryland, C. J. Glasson, H. W. Doll, J. Tate, W. A. Taylor, A. W. H. Donaldson, J. F. Venables, E. B. Sunderland, C. W. Roe, F. C. Greig, J. P. Blockley, D. W. Beamish, W. Leslie, J. Parker, C. C. Beatty, W. A. Brown, R. H. Fothergill, D. M. MacManus, U. J. Bourke, H. N. Everard, H. S. de Boer, G. A. C. Gordon, D. Green, C. Banting, R. W. Murphy, W. G. Ridgway, R. A. Wright, B. M. Collard, T. J. R. Maguire, B. H. Barton, G. F. Barr, P. H. MacDonald, C. L. Wigan, J. C. Robb, W. S. Heron, R. MacGrath, C. N. Vaisey, L. A. Drake, H. J. Cotter, T. S. Goodwin, J. S. Prentice, W. J. A. B. Wishart, W. S. Lindsay, G. Davidson, G. T. Cregan, H. S. Stockton, C. de C. Pellier, and J. R. Lee.

Temporary Honorary Lieutenant O. G. Morgan to be temporary Honorary Captain whilst serving with No. 9 British Red Cross (Duchess of Sutherland's) Hospital.

Lieutenant M. W. Paterson to be Captain.

The undermentioned temporary Honorary Lieutenants to be temporary Lieutenants:—E. J. Clark, W. J. Pearson, and C. F. Maclachlan.

The undermentioned to be temporary Lieutenants:—C. Cooper, W. H. Broughton, M. Campbell, W. Paul, W. Speedy, R. A. Warters, G. FitzGerald, A. D. Moffat, J. J. Clarke, R. E. Illingworth, A. D. Hunt, D. R. Taylor, A. W. Mather, A. C. Tait, C. W. C. Robinson, E. L. Christoffelsz, J. G. M. Molony, A. D. Buchanan, N. A. Boswell, W. D. D. Small, R. M. Hewitt, J. P. Fairley, R. Montgomery, L. T. Giles, H. C. Fox, E. W. Martin, C. S. Rivington, W. M. Muirhead, E. H. Cameron, J. Bain, W. B. Mercer, R. R. Watts, C. M. G. Elliott, N. Grace, S. Stockman, F. W. Craig, J. Oag, A. McL. Pilcher, H. N. Ingham, F. J. Eagar, P. G. Temple, J. F. St. J. Annesley, A. H. Donaldson, and J. McF. Grier.

The undermentioned to be Honorary Lieutenants:—W. R. White-Cooper and H. W. Bennett.

The undermentioned temporary Lieutenants relinquish their commissions:—C. A. Smallhorn, H. W. Fankhausen, S. Reader, J. N. G. W. McMorris, F. L. Gill, P. Steele, F. J. Browne, A. E. Townley, H. F. Smith, W. M. Thomas, A. F. G. Codd, H. Armstrong, G. De P. D'Amico, R. N. Geach, G. O. Jacobsen, M. P. Thomas, G. M. De Vines, and J. R. McGilvray.

INDIAN MEDICAL SERVICE.

Temporary Lieutenant J. McIntire Falkiner to be temporary Captain.

A. C. Dutt, R. N. Kapadia, N. B. Aich, S. C. Sen, P. R. Vakil, and B. Rai have been granted the temporary rank of Lieutenant.

The King has approved the retirement of Lieutenant-Colonels W. R. Clark, G. S. Thomson, and C. G. Webster, and Majors W. G. Richards and W. C. Long.

SPECIAL RESERVE OF OFFICERS.

Royal Army Medical Corps.

The undermentioned Lieutenants to be Captains: W. J. Dowling, A. R. F. Clarke, A. J. Horne, N. L. Reis, C. E. H. Gater, D. C. Pim, F. R. S. Shaw, R. G. Blair, F. R. H. Mollan, G. Stanton, J. D. Proud, T. W. E. Elliott, J. O'S. Beveridge, A. J. Beveridge, S. D. Lodge, C. H. Brennan, E. N. H. Gray, J. A. Musgrave, T. McClurkin, T. Menzies, R. S. Cumming, D. H. Murray, W. A. Thompson, J. McKay, W. B. Foley, D. Dempster, and T. Y. Barkley.

Lieutenant (on probation) T. E. B. Beatty is confirmed in his rank.

Cadet W. L. A. Harrison, London University Contingent, O.T.C., to be Lieutenant.

TERRITORIAL FORCE.

Army Medical Services.

Captain A. Baxter, from Attached to Units other than Medical Units, to be Deputy Assistant Director of Medical Services, Mounted Division.

J. Ewing (late Captain, West Riding Field Ambulance, and late temporary Captain, R.A.M.C.) to be Captain and a Deputy Assistant Director of Medical Services.

Royal Army Medical Corps.

Welsh Border Mounted Brigade Field Ambulance: Major J. B. Yeoman, from Army Medical Services, to be Major.

Highland Field Ambulance: Lieutenant J. A. Sellar to be Captain.

South Midland Field Ambulance: Lieutenant E. J. C. Groves is restored to the establishment.

London General Hospital: J. A. Willett to be Lieutenant.

Southern General Hospital: Lieutenants C. B. Hawthorne and J. Millard to be Captains.

West Lancashire Casualty Clearing Station: Lieutenant T. Aspinall to be Captain.

North Midland Casualty Clearing Station: N. H. Hill to be Lieutenant.

Yorkshire Mounted Brigade Field Ambulance: Lieutenant A. M. Deane to be Captain.

West Lancashire Field Ambulance: Captain E. W. Reed, from Attached to Units other than Medical Units, to be Captain.

London (City of London) Sanitary Company: To be Lieutenants: J. Teare and F. E. W. Rogers.

London Sanitary Company: To be Lieutenants: S. Summerson and E. P. Wheeler.

Attached to Units other than Medical Units.—Major T. Beard resigns his commission on account of ill-health. Lieutenants S. Hughes and F. J. Davidson to be Captains.

DEATHS IN THE SERVICES.

Lieutenant-Colonel Thomas Michael O'Brien, A.M.S. (retired), recently at his residence in Exeter. He joined the Army Medical Service in 1858, and shortly afterwards went to India, and, except for two short periods of time, remained in India until 1887. In 1888 he was appointed chief medical officer of the Exeter military hospitals. He retired in 1899, but still continued to reside in Exeter, where he had numerous friends and was highly respected and esteemed. He leaves a widow and married daughter.

JOURNAL OF THE ROYAL ARMY MEDICAL CORPS.

First place is given in the January issue of this journal to a long and excellently illustrated article by Surgeon-General Sir George Makins on a Study of 111 Cases of Perforating Wounds of the Gastro-intestinal Canal which occurred amongst a consecutive series of 202 perforating wounds of the abdomen in which the presence of visceral injury was certain. The Toxicity of Emetine is the title of a joint paper by Temporary Lieutenant-Colonel Andrew Balfour, C.M.G., and Frank Lee Pyman, D.Sc., Ph.D., in which the conclusion is drawn that more information on the subject is required, and the hope is expressed that medical officers serving with the Mediterranean Expeditionary Force who have administered emetine in cases of amœbic dysentery will not hesitate to place their experiences on record. Captain A. W. Ormond, R.A.M.C. (T.), and Major A. F. Hertz describe the treatment of "Concussion Blindness" by hypnosis, good results having been obtained; and Captain T. H. Just contributes a survey of the results obtained during six months of enteric bacteriology at a general hospital. In a paper on a Classification of Meningococci Based on Group Agglutination obtained with Monovalent Immune Rabbit Sera, Captain A. W. M. Ellis suggests that in the treatment of cerebro-spinal fever better results might be obtained and more exact knowledge of the adequacy of serum treatment gained, if monovalent horse serum of appropriate type were employed in place of the polyvalent sera. Meningococcus Carriers are discussed in a joint paper by Captain L. Colebrook and Lieutenant H. H. Tanner, while a Starch Medium for the Identification of the Meningococcus by its Sugar Reactions forms the subject of a report to the Medical Research Committee by Mr. H. W. C. Vines, B.A.

THE RUSSIAN ORDER OF ST. ANNE.

Temporary Surgeon Thomas Stratford Bradburn, R.N., has received the Royal Licence and authority to wear the Third Class of the Order of St. Anne, with swords, which has been conferred upon him by the Emperor of Russia in recognition of valuable services rendered.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

In the 96 English and Welsh towns with populations exceeding 50,000 persons at the last Census, 7301 births and 5098 deaths were registered during the week ended Saturday, Feb. 5th. The annual rate of mortality in these towns, which had been 13·9, 14·2, and 14·0 per 1000 in the three preceding weeks, rose in the week under notice to 14·7 per 1000 of their aggregate population, estimated at 18,136,180 persons at the middle of the year 1914. During the first five weeks of the current quarter the mean annual death-rate in these towns averaged 14·2, against a corresponding rate of 13·6 in London. The annual death-rate last week ranged from 3·4 in Ilford, 4·9 in Swindon, 8·2 in Hornsey, in East Ham, and in Newport (Mon.), 8·6 in Northampton, and 9·1 in Bournemouth, to 20·6 in Liverpool, 20 8 in Burnley, 21·1 in South Shields, 22·2 in Dewsbury, and 24·3 in West Hartlepool.

The 5098 deaths from all causes were 238 in excess of the number in the previous week, and included 340 which were referred to the principal epidemic diseases, against 305 and 314 in the two preceding weeks. Of these 340 deaths, 104 resulted from whooping-cough, 70 from infantile diarrhœal diseases, 63 from diphtheria, 62 from measles, 28 from scarlet fever, 12 from enteric fever, and 1 from small-pox. The death-rate from these diseases was equal to 1·0, against 0·9 per 1000 in each of the two preceding weeks. The deaths attributed to whooping-cough, which had been 78, 74, and 80 in the three preceding weeks, further rose to 104, and included 28 in London, 10 in Liverpool, 9 in Birmingham, 5 each in Leicester and Manchester, and 4 each in West Ham, Coventry, and Leeds. The deaths of infants (under 2 years) from diarrhœa and enteritis, which had been 60, 60, and 68 in the three preceding weeks, further rose to 70, of which 17 were recorded in London, 4 each in Birmingham and Sheffield, and 3 each in Stoke-on-Trent, Leeds, and Liverpool. The fatal cases of diphtheria, which had been 84, 79, and 70 in the three preceding weeks, further fell to 63; 16 deaths were registered in London, 4 each in Portsmouth, Plymouth, and Liverpool, and 3 each in Bristol, Stoke-on-Trent, Birmingham, and St. Helens. The deaths attributed to measles, which had declined from 81 to 62 in the four preceding weeks, were again 62 last week, and included 8 in London, 6 each in Nottingham, Stockport, and Burnley, and 5 each in Bristol, Leicester, and Leeds. The deaths referred to scarlet fever, which had been 23, 10, and 25 in the three preceding weeks, rose to 28, of which 7 occurred in London, 4 in Stoke-on-Trent, and 2 each in Manchester, Sheffield, and Newcastle-on-Tyne. The fatal cases of enteric fever which had been 9 in each of the three preceding weeks, rose to 12, and included 3 in Wigan and 2 in Reading. The death from small-pox was registered in Salford.

The number of scarlet fever patients under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, which had been 2224, 2257, and 2189 at the end of the three preceding weeks, further fell to 2153 on Saturday last; 253 new cases were admitted during the week, against 244, 286, and 260 in the three preceding weeks. These hospitals also contained on Saturday last 1557 cases of diphtheria, 143 of whooping-cough, 48 of enteric fever, and 47 of measles, but not one from small-pox. The 1206 deaths from all causes in London were 4 in excess of the number in the previous week, and corresponded to an annual death-rate of 13·9 per 1000. The deaths referred to diseases of the respiratory system, which had been 264, 254, and 231 in the three preceding weeks, fell to 225 in the week under notice, and were 272 below the number registered in the corresponding week of last year.

Of the 5098 deaths from all causes in the 96 towns, 191 resulted from violence and 377 were the subject of coroners' inquests, while 1415 occurred in public institutions. The causes of 58, or 1·1 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest. All the causes of death were duly certified in Leeds, Bristol, West Ham, Bradford, Hull, Newcastle-on-Tyne, and in 67 other smaller towns. Of the 58 uncertified causes, 13 were registered in Liverpool, 10 in Birmingham, 3 each in Gateshead and London, and 2 each in 10 other towns.

HEALTH OF SCOTCH TOWNS.

In the 16 largest Scotch towns with an aggregate population estimated at 2,355,300 persons at the middle of this year, 1034 births and 606 deaths were registered during the week ended Saturday, Feb. 5th. The annual rate of mortality in these towns, which had been 15·4, 14·4, and 14·6 per 1000 in the three preceding weeks, fell to 13·4 per 1000 in the week under notice. During the first five weeks of the current quarter the mean annual death-rate in these towns averaged 14·7, against a corresponding rate of 14·2 per 1000 in the large English towns. Among the several towns the death-rate last week ranged from 2·3 in Clydebank, 9·9 in Motherwell, and 11·4 in Edinburgh, to 19·4 in Paisley, 20·1 in Greenock, and 21·5 in Perth.

The 606 deaths from all causes were 52 fewer than the number in the previous week, and included 50 which were referred to the principal epidemic diseases, against 43 and 59 in the two preceding weeks. Of these 50 deaths, 22 resulted from measles, 14 from diphtheria, 7 from scarlet fever, 6 from infantile diarrhœal diseases, and 1 from enteric fever, but not one from whooping-cough or from small-pox. The annual death-rate from these diseases was equal to 1·1, against a corresponding rate of 1·0 per 1000 in the large English towns. The deaths attributed to measles, which had been 23, 19, and 29 in the three preceding weeks, fell to 22, and included 6 in Greenock, 5 in Glasgow, 4 in Coatbridge, and 2 each in Edinburgh and Ayr. The deaths referred to diphtheria, which had been 13, 8, and 15 in the three preceding weeks, were 14 last week, of which 5 occurred in Glasgow and 4 in Edinburgh. The fatal cases of scarlet fever, which had declined from 18 to 7 in the four preceding weeks, were again 7 last week, and included 5 in Glasgow. The deaths of infants (under 2 years) from diarrhœa and enteritis, which had been 13, 4, and 13 in the three preceding weeks, fell to 6, of which 2 occurred in Glasgow. The fatal case of enteric fever was recorded in Dundee.

The deaths referred to diseases of the respiratory system, which had been 114, 92, and 97 in the three preceding weeks, fell to 73 in the week under notice, and were 229 below the number registered in the corresponding week of last year. The deaths from violence numbered 23, against 37 and 23 in the two preceding weeks.

HEALTH OF IRISH TOWNS.

In the 19 town districts of Ireland, with populations exceeding 10,000 persons at the last Census, 530 births and 388 deaths were registered during the week ended Saturday, Jan. 29th. The annual rate of mortality in these towns, which had been 21·0, 17·4, and 17·9 per 1000 in the three preceding weeks, fell in the week under notice to 17·6 per 1000 of their aggregate population estimated at 1,148,468 persons at the middle of last year. During the first four weeks of the current quarter the mean annual death-rate in these town averaged 18·5, against corresponding rates of 14·1 and 15·1 per 1000 in the English and Scotch towns respectively. The death-rate during the week under review was equal to 19·5 in Dublin (against 13·9 in London and 14·4 in Glasgow), 15·0 in Belfast, 27·2 in Cork, 13·9 in Londonderry, 17·6 in Limerick, and 11·4 in Waterford, while in the 13 smaller towns the mean rate was 16·7 per 1000.

The 388 deaths from all causes were 7 fewer than the number in the previous week, and included 27 which were referred to the principal epidemic diseases, against 30 and 32 in the two preceding weeks. Of these 27 deaths, 8 resulted from infantile diarrhœal diseases, 7 from whooping-cough, 6 from measles, 4 from enteric fever, and 2 from diphtheria, but not one from scarlet fever or from small-pox. The annual death-rate from these diseases was equal to 1·2, against corresponding rates of 0·9 and 1·5 per 1000 in the English and Scotch towns respectively. The deaths of infants (under 2 years) from diarrhœa and enteritis, which had been 8, 6, and 8 in the three preceding weeks, were again 8 in the week under notice, and included 6 in Dublin. The deaths attributed to whooping-cough, which had been 4, 5, and 8 in the three preceding weeks, numbered 7, of which 3 were recorded in Belfast and 2 in Portadown. The fatal cases of measles, which had been 9, 14, and 9 in the three preceding weeks, fell to 6 and included 3 in Belfast. Of the 4 deaths from enteric fever, 3 were registered in Cork and 1 in Dublin, while those from diphtheria occurred in Dublin and Belfast.

The deaths referred to diseases of the respiratory system, which had declined from 147 to 63 in the four preceding weeks, were again 63 in the week under notice, and were 96 below the number registered in the corresponding week of last year. Of the 388 deaths from all causes, 132, or 34 per cent., occurred in public institutions, and 8 resulted from violence. The causes of 19, or 4·9 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest, and included 7 in Dublin and 3 in Limerick; in the large English towns the proportion of uncertified causes did not exceed 0·9 per cent.

UNIVERSITY OF SHEFFIELD.—The Council, at its meeting on Feb. 7th, appointed Dr. Arthur J. Hall, senior physician to the Sheffield Royal Hospital, to the Professorship of Medicine, in succession to Dr. Duncan Burgess.

Correspondence.

"Audi alteram partem."

ALBUMINURIC RETINITIS IN EPIDEMIC (ACUTE) NEPHRITIS.

To the Editor of THE LANCET.

SIR,—The war has raised many problems, some new, others old but brought into fresh prominence. Among these is that of acute nephritis. It might have been expected that acute nephritis would be common among those who had passed through the cold exposure of trench life, yet the war has conclusively shown that cold and exposure as such are at the most contributory causes only. The outbreak in the warm weather, when the winter was past, was so extensive that it deserved the name of epidemic nephritis given to it, though investigation has so far failed to track the cause down to any recognisable infection or germ. The study of a series of these cases at St. Bartholomew's Hospital has led to most interesting results in the capable hands of Dr. W. Langdon Brown and his co-workers.

One special branch of the subject has recently been dealt with in this journal[1] by Mr. R. Foster Moore, in an article entitled "Renal Retinitis in Epidemic Nephritis." The paper is a valuable one, but its value would have been greater if Mr. Foster Moore had carefully defined what he meant by chronic nephritis and by renal retinitis.

Chronic nephritis.—Acute nephritis if it lasts some time leads to the large white kidney which is commonly called *chronic parenchymatous nephritis*, and in this condition may persist for months.[2] Whether it ever passes into the contracted form or not is a question which need not be discussed here. The *contracted form* certainly in the vast majority of cases gives no history of acute nephritis, and is probably essentially a degenerative and not a post-inflammatory condition. Bright in his original papers distinguished sharply between the two forms, and stated that he was unable to satisfy himself that there was any connexion between them. Wilks, with all his experience, said that he had failed to establish any relation between them, and held them to be different diseases. My own experience has led me to the same conclusion. Proof must depend upon clinical evidence and this is lacking. Chronic nephritis is often used to cover both the groups, and confuses two conditions which are essentially distinct—viz., parenchymatous nephritis of some duration, i.e., in its later stages, and granular kidney.

Albuminuric retinitis.—This also exists in two forms which ought to be sharply distinguished from one another. I named them some years ago the exsudative and the degenerative form. They are quite distinct from one another in their ophthalmoscopic appearances, in their pathology, as well as in their clinical significance.

The *exsudative form* is the same as that usually understood by the term acute optic neuritis, and is like that seen with a cerebral tumour. It may occur in acute or chronic parenchymatous nephritis, and may then resolve and disappear if the nephritis recover. It may also occur in granular kidney, when it is most unlikely to resolve because it is rarely if ever seen, except in the terminal stage and when the end is near.

[1] THE LANCET, Dec. 18th, 1915, p. 1348.
[2] THE LANCET, Nov. 20th, 1915, p. 1123.

The *degenerative form* presents the glistening white patches round about the yellow spot especially, which are so characteristic of albuminuric retinitis. It is pathognomonic of grauular kidney, for it occurs in no other disease. It is the result of permanent degenerative changes in the retina and never disappears. It may in the later stages of granular kidney have grafted on it, or added to it, the exsudative form, but the two forms are even then independent of one another.

The statements made about albuminuric retinitis in books are hopelessly contradictory, and this is not surprising, for with two forms of chronic nephritis distinct from one another and two forms of albuminuric retinitis also distinct from another there is plenty of room for divergence or contradiction if the distinctions are not made and not clearly observed.

When equally competent observers contradict one another on questions of fact it must follow either that they are dealing not with the same but with different facts, or that the facts are not simple but complex and coloured by different theories, or that the same words are used to denote different things. The two terms which lead to all this confusion are chronic nephritis and albuminuric retinitis. If these are properly defined and the distinctions strictly observed all the apparent contradictions can be reconciled.

It is now possible to put Mr. Foster Moore's observations into the category to which they rightly belong. It is clear: 1. That all the cases he deals with are acute nephritis. Even what he calls chronic nephritis is merely acute nephritis which has lasted somewhat longer than the others; and the pathological condition is that of chronic parenchymatous nephritis or the large white kidney. 2. That the form of albuminuric retinitis met with in his cases is of the exsudative type.

Thus defined Mr. Foster Moore's paper has a greater value than he claims for it. It shows first that albuminuric retinitis in one of its forms occurs in acute nephritis, on which he expressed a somewhat uncertain opinion. There can be no doubt of the fact, in spite of the statement he quotes on Sir Wilmot Herringham's authority. I have seen many instances of it myself, and recorded some in my Lettsomian lectures as long ago as 1900. Not only does it occur, but it is not altogether uncommon. Mr. Foster Moore met with it in 4·2 per cent. of the 119 cases he observed. It is most likely to be met with in cases of some standing—eight or nine weeks he seems to regard as making the disease chronic, but such a duration is really short, for many cases of acute nephritis which get perfectly well last as long as this and much longer, too. Nor is mere duration of itself sufficient, for albuminuric retinitis may remain absent in cases of much longer duration. He refers himself to one of 20 weeks' duration. Three out of the five cases he quotes were severe, for they had uræmia.

To sum up the facts as my experience leads me to do, I should say: 1. Albuminuric retinitis may occur and is not rare in acute nephritis. 2. It is of the exsudative type. 3. It is an indication of the severity of the case, and though more likely to be found in cases of some duration, it may be present quite early if the case be severe or remain absent throughout if the case be mild. 4. In any case, if the nephritis resolve it may completely disappear and leave no defect of vision behind. 5. The statement that it is toxic in origin is probably correct.

Mr. Foster Moore's observations are a distinct contribution to the subject, and so far as acute nephritis is concerned confirm the views I expressed definitely in my Lettsomian lectures of 1900.

On consulting recently a large encyclopædia of ophthalmology, published only two years ago, the chapter on albuminuric retinitis is as vague and unconvincing as ever, and the important distinctions I have mentioned are not even referred to, so that no excuse is necessary for reiterating what I have so often written.—I am, Sir, yours faithfully,

SAMUEL WEST, M.D. Oxon., F.R.C.P. Lond.

Wimpole-street, W., Jan. 30th, 1916.

INVERSION OF THE PELVIC BONES.

To the Editor of THE LANCET.

SIR,—In your issue of Feb. 5th Professor G. Elliot Smith makes some critical remarks on my paper on Inversion of the Ilium and Sacrum and Ischium and Pubes ..... as causes of deformities of the female pelvis.[1] I hope I may be allowed by your courtesy to reply to his remarks, which are as follows:—

Dr. D. Berry Hart's memoir (see THE LANCET, Jan. 29th, p. 255) does not warrant the assumption that the inversion of the pelvic bones as a cause of trouble in the female is a pathological condition newly discovered by him. Dr. Douglas E. Derry, when working in the Medical School in Cairo, was the first to give an adequate explanation of the significance of the preauricular grooves in the female os innominatum, and both he and Professor Wood Jones called attention to cases in ancient Nubian skeletons where inversion of the pelvic bones was a cause of deformity. In several cases they found the fœtal head impacted in such pelves.

This account is incorrect. In the first place, Zaaijer in 1866 drew attention to the sulcus preauricularis, and Dr. Derry says: "Another feature of considerable significance in determining the sex of a given bone may be found in the groove or sulcus first described by Zaaijer in 1866." It is not found constantly and is of secondary importance, although Professor Wood Jones says "it is by far the most valuable sexual indication we have."[2] The important means of sexing pelvis is the sacrosciatic notch, and on this I say in my paper, "General anatomists have, however, drawn attention to special differences between the male and female ilium, since it is of importance, as Elliot Smith and Wood Jones have shown in archæological work, to determine the sex from an isolated ilium." I then give the points as to the sacrosciatic notch. In regard to obstetricians I criticise them and myself, of course, for neglecting these questions, and praise the general anatomists for their work in regard to them. What I claim to have shown is that in certain deformed pelves the deformity is due to inversion of the ilium or of the ischium and pubes. On this Professor Elliot Smith says as to the cases where the women had died in labour: "In every one of these cases the pelvis was of abnormal form and most of them exhibited a sex contradiction."[3] Nowhere, so far as I am aware, is inversion spoken of. The terms "sex contradiction" is incorrect, as the sex gland is the criterion of sex, whereas the pelvis is part of the sex-ensemble. I must finally ask Professor Elliot Smith to quote any passages in my paper where I have claimed any originality as to the facts of the sacrosciatic notch and sulcus preauricularis. He might also quote from his monograph any statement he makes as to his cases of deformed pelves being termed "inversion." He uses the term "sex contradiction" in it and "inversion" for the first time in his letter.

I am, Sir, yours faithfully,

Edinburgh, Feb. 7th, 1916. D. BERRY HART.

[1] See Edinburgh Medical Journal, January, and exact summary in THE LANCET of Jan. 29th, p. 256.

[2] Elliot Smith and Wood Jones, op. cit., p. 280.

[3] Op. cit., p. 200.

FUNCTIONAL NERVOUS DISEASES.

To the Editor of THE LANCET.

SIR,—I read with pleasure Captain William Brown's logical and temperate letter published under this heading in your issue of Jan. 29th. Those who have followed the modern developments of the psycho-analytic (or, as Captain Brown prefers to call it, the autognostic) method of treatment of functional nervous disease must realise that the theory of Freud is too limited to account for all the observed facts, but this should not in itself make this method of treatment disreputable. As practised now, psycho-analysis is a careful inquisition into the mental history and processes of a patient, by means of free association, word association, and dream analysis, with the object of finding out whether there is or is not anything in these processes that has a bearing on his present disability. If such a factor is discovered, the thorough understanding by the patient of its association with the nervous manifestation from which he suffers has a striking effect as far as the relief of this manifestation is concerned.

There are at present three chief methods by means of which functional nervous manifestations may be attacked; these are—psycho-analysis, hypnosis, and isolation. My own experience, as officer in charge of the nerve hospitals in the 2nd Western Command, is limited to the first and third of these three methods, but the value of hypnosis has been convincingly demonstrated quite recently in your journal by Major C. S. Myers.

As regards psycho-analysis, my experience is that improvement in the patient's condition is brought about in the majority of cases so treated, but that there is a strong tendency to relapse. The treatment has to be persisted in for a very considerable time, and even then, after an apparent cure, a subsequent relapse is not infrequent. There are, however, a certain number of patients that are not improved at all by this method, though this number does not form a large proportion of the cases treated.

In the case of treatment by isolation I find that the results are of the "all or nothing" category: if the patient reacts at all the improvement is more lasting, but the number of patients that do improve is less than in the case of the psycho-analytic method.

It seems to me that the point to which attention ought to be devoted now is the indications by means of which we may come to a decision as to which method of treatment is likely to give the best result in any particular case. In the present state of our knowledge this is not at all an easy decision to form, and the difficulty is by no means lessened by adopting a hostile attitude towards any one method. The mental configurations of a large number of patients must of necessity be diverse, and it is only reasonable to assume that these three methods of treatment possess different values in different cases.

I am, Sir, yours faithfully,

DONALD E. CORE,
Captain, R.A.M.C. (T.F.), Honorary Physician to the Ancoats Hospital, Manchester.

2nd Western General Hospital, Feb. 1st, 1916.

THE INCOME-TAX AND GRATUITIES TO TEMPORARY LIEUTENANTS, R.A.M.C.

To the Editor of THE LANCET.

SIR,—As is well known, certain gratuities and bonuses are granted by the War Office to temporary lieutenants of the Royal Army Medical Corps after 12 months' service, and a question has arisen as to whether such grants become taxable as "income" under the present Finance Acts. As the matter was one which was by no means clear and was of much interest to the military members of our profession, I applied to Sir Henry Craik, M.P., K.C.B., the Parliamentary representative for Aberdeen and Glasgow Universities, for his valuable aid in putting a question to the Treasury through its Parliamentary Secretary, Mr. Montagu. The reply, written and addressed to Sir Henry Craik, is, I take it, of sufficient importance to be recorded in your journal, and I accordingly append it:—

I return herewith the letter from the Medical Defence Union which you handed to me respecting bonuses and gratuities given to temporary lieutenants, R.A.M.C. It seems probable that these bonuses and gratuities are generally given, under the officer's contract, for satisfactory service. At any rate there is no reason to doubt that they are given in respect of and in consideration of his services, and as such they will be liable to income-tax. I may perhaps add that firstly an officer in the Royal Army Medical Corps will come under the liberal relief provisions of Section 25 (1) of the Finance (No. 2) Act, 1915, if his total income does not exceed £300, and secondly, under Section 13 (1) of the Finance Act, 1914 (Session 2), and Section 20 of the Finance Act, 1915, he will only bear tax in respect of the practice he has given up on the basis of the actual profits (if any) of the year, instead of on the average of the past three years.

This will effectively clear the issues involved and make the position no longer doubtful.

I am, Sir, yours faithfully,

A. G. BATEMAN,
General Secretary, Medical Defence Union.

4, Trafalgar-square, W.C., Feb. 4th, 1916.

AMMONIA AS AN ENEMA.

To the Editor of THE LANCET.

SIR,—May I draw your readers' attention to the effectiveness of an ammonia enema in the treatment of post-operative ileus and intestinal paresis. This sequela of an abdominal operation all have found to be most distressing to the patient, while it is exasperating to the surgeon, and in extreme cases even dangerous to the patient's life. I understand that at the front it has proved frequently a fatal complication of operations for abdominal wounds.

The prescription is liq. ammon. fort. 1 dr., water 1 pint, administered as an enema; its effect is greatly enhanced by a hypodermic of pituitrin extract 1 c.c. half an hour previously. This treatment is sure to result in a good motion and discharge of excessive flatus, and again and again I have found it to act where the ordinary enemata, turpentine, eserine, &c., had failed. Two words of warning I would give—namely, that if used frequently, or if used in greater strength than I suggest, injury to the rectal mucous membrane is liable to take place. On two occasions the daily administration of the enema for three consecutive days resulted in a certain amount of rectal hæmorrhage. On another occasion the mistake of a nurse in putting in too much ammonia gave the patient a very painful septic colitis lasting for a week.

My excuse in writing about this is that although I do not claim originality I have not been able to find in any text-book any mention of ammonia used as an enema, nor have I ever met anyone in England who ever heard of it. Yet I am convinced of its importance.—I am, Sir, yours faithfully,

T. A. BLACK, M.B.,
Resident Medical Officer, Barnes Convalescent Hospital, Cheadle.

Feb. 1st, 1916.

MATRICULATION AT THE UNIVERSITY OF MANCHESTER.

To the Editor of THE LANCET.

SIR,—In the report of the Committee of Management to the Conjoint Examining Board of the Royal Colleges, as well as in the report of the Comitia of the Royal College of Physicians, it has been stated that Latin is no longer a compulsory subject in the entrance examination to the Faculty of Medicine in the University of Manchester.

I should be glad if you would allow me to correct this misunderstanding. The University of Manchester has not modified the matriculation requirements.—I am, Sir, yours faithfully,

G. ELLIOT SMITH,
Dean of the Faculty of Medicine, University of Manchester.

Feb. 8th, 1916.

*** The excerpt from the report of the Committee of Management, in our account of the Comitia of the Royal College of Physicians of London, was an accurate reproduction of the words of the report.—ED. L.

THE TREATMENT OF WHOOPING-COUGH.

To the Editor of THE LANCET.

SIR,—I have read with interest the annotation on whooping-cough in THE LANCET of Jan. 29th. I vividly remember the sufferings of my own children several years ago from this horrible disease, and the heart-breaking failure of one drug after another to even more than very slightly relieve the symptoms. Practically every one of those mentioned was tried under the advice of a distinguished colleague. From that time until a year ago I have as signally failed. During the early part of 1915 several cases came under my notice, and I painted the children's chests front and back with a mixture of cantharides, croton oil, and almond oil. The result was most gratifying. Every case was aborted within 14 days. The following is a good formula:—

R	Ol. croton.	℥ i.
	Cantharadini	gr. iii.
	Acidi acet. fort.	℥ i.
	Ol. amygdal. dulc. ...	ad. ℥ viii.

The painting was carried out weekly and occasioned no distress. I am, Sir, yours faithfully,

Bournemouth, Feb. 1st, 1916. W. J. MIDELTON.

SODIUM GYNOCARDATE IN LEPROSY.—Mr. W. Martindale writes to us, pointing out that palmitic acid is one of the natural constituents of genuine chaulmoogric acid, and cannot be termed "an impurity," to use Sir Leonard Rogers's phrase in our columns last week. Samples may certainly vary in the amount contained.

THE SOUTH AFRICAN HOSPITAL. — Lord Gladstone, writing to the press on behalf of the South African Hospital and Comforts Fund, has intimated that a programme has now been drawn up providing for a completely equipped hut hospital in Richmond Park. As far as possible the medical and nursing staff will be obtained from South Africa. The office address of the institution is 3, London Wall Buildings, E.C.

Obituary.

CHARLES STONHAM, F.R.C.S. ENG., C.M.G.,

COLONEL, A.M.S; SENIOR SURGEON TO WESTMINSTER HOSPITAL.

Charles Stonham was born at Maidstone in 1858. He was educated at King's School, Canterbury, and went to University College Hospital Medical School, where he gained the Atchison Scholarship in 1881. In a successful academic career he took gold medals in surgery and obstetric medicine at the University of London, becoming an F.R.C.S. in 1884. He was a man of great natural ability, who profited to the full from the teaching given by the distinguished men then on the staff of the hospital. Marcus Beck was the great exemplar upon whom he modelled himself, whilst Berkeley Hill gave him an inclination for his particular line of practice. In addition, as obstetric assistant under Sir John Williams he obtained a good introduction to abdominal surgery. His connexion with University College Hospital continued for some years; he held successively all the resident posts, was senior demonstrator of anatomy in the medical school, and whilst he served as curator of the pathological museum he worked with great zeal at a descriptive catalogue of the surgical, gynæcological, and obstetric specimens.

For a short time he was on the surgical staff of the North-West London Hospital and of the Cancer Hospital; later on he was for a time surgeon to the Poplar Hospital for Accidents. He was appointed assistant surgeon to the Westminster Hospital in 1887, when he resigned his other posts. He at once made his mark at Westminster; within ten years he became senior surgeon and lecturer on surgery, and was recognised by all his colleagues as a notable acquisition to the staff. Meanwhile his wide knowledge of surgical pathology and his previous experience enabled him to restore, and write a catalogue of, the hospital museum, and later he made use of this accurate and multifarious information and became the author of a manual of surgery in three volumes. His appointments as examiner included that in anatomy on the English Conjoint Board and in surgery at the Apothecaries' Society, and in recent years he had been examiner in surgery at the University of Ireland.

Stonham's commanding, spare figure, striking face, and the force he threw into speech and movement impressed not only students but colleagues and patients, while he possessed the skill that his dramatic appearance promised. He was perfectly ambidextrous; his long, thin hands were used most skilfully; he was a very rapid operator, beginning and ending quickly, yet proceeding with all due care and caution at critical points. The following are crucial instances supplied to us by one of his colleagues of his surgical skill in combination with anatomical knowledge. "A man had a rapidly increasing aneurysm of the *second* part of the *left* subclavian artery. At the first operation Stonham ligatured the arterial branches distal to the sac; at the second operation he divided the clavicle and ligatured the *first* part of the artery. The man was seen some years afterwards by the writer of this note, and his vascular condition had meanwhile been stationary. Later, the patient died in the country, but efforts to obtain a post-mortem examination failed. Again by a truly major operation he removed the upper extremity along with the breast of a woman for malignant disease. She got up with the wound healed 10 days after the operation and was able to leave the hospital."

Whilst busily engaged as a hospital surgeon and with private practice he distinguished himself in other ways. He was in early life an enthusiastic mountaineer, and as a member of the Alpine Club made some noteworthy climbs. He displayed, perhaps, his most original talent as an observer of birds. He filled his house with a beautiful and rare collection of birds and their eggs, and he published a large book entitled "Birds of the British Islands," notable for the guidance he gave to the artist in making the drawings, as well as for the bird-lore included in the text.

Stonham's death was a direct casualty of the war. He commenced his military service as surgeon in the Middlesex Yeomanry. At the outbreak of the South African War he organised and took out as surgeon-in-chief the Imperial Yeomanry Field Hospital, of which he afterwards published a full account. A remarkable incident happened not long after landing. He, with his field ambulance, arrived soon after De Wet had attacked and captured the Derby Militia. It devolved upon Stonham as the senior officer present to arrange matters with the Boer general and to transmit the first knowledge of the mishap to the British authorities. He was mentioned in despatches, received the medal with four clasps, and was made a C.M.G. On his return he continued his ambulance work and devoted an immense amount of time to the training of recruits and to the provision of equipment and horses for a mounted ambulance. In spite of endless difficulties from lack of funds and support, his unit was able to take part in manœuvres, and at the beginning of the present war was found ready. He could have taken it out to France with the first Expeditionary Force. Unfortunately he had to undergo the severest trial to his patience; his trained men and horses had to be transferred to fill up deficiencies elsewhere, and he had to spend a winter in East Anglia, replacing what had been taken from him. At last he was ordered to Egypt, where he became Inspector of Hospitals; the testimony to his good work in that position has been many-sided and warm. He was promoted to be Colonel in the Army Medical Service. Very soon, alas, his health failed. He had suffered in recent years from emphysematous attacks, when a short holiday in the south at this time of year would restore him. But last winter tried him severely; in Egypt he was again attacked, at a time when he was weakened by dengue and dysentery. Forced to take sick leave he went to Cannes but failed to recuperate there as in previous years. He reached home very weak, attacks of breathlessness continued, and he died on Feb. 1st. His funeral with military honours took place on Feb. 3rd at Golder's Green. At the same time a service was held in the chapel at Westminster Hospital, where the memory of Stonham will long be kept green.

Sir Bryan Donkin writes:—

I send you a few words in memory of my old friend and colleague Colonel Stonham, whose untimely death I greatly mourn. His loss will be felt deeply by all those who knew him well and by the hospital he served so ably and earnestly during his 29 years on the surgical staff. He and I were intimate friends from almost the beginning of our acquaintance in 1887 until his death, and were active colleagues at Westminster Hospital for about 12 years. Others will doubtless write in detail about his marked ability as a surgeon. My own opinion of the high skill and conscientious

care that he showed in all his work caused me to seek his assistance in most of the cases that came before me requiring the aid of surgical opinion or operation, and I have many vivid memories both of his prompt and untiring help in serious cases, as well of his abounding generosity and warm sympathy in dealing with his patients. As a teacher of surgery he ranked very high, as many of his pupils can certainly testify. His name must stand out long and prominently among the best surgeons who have ever worked and taught at Westminster Hospital. Stonham was a man of determined character, scrupulously honest, self-reliant, and fearless. These qualities, with which his manner and strikingly attractive appearance thoroughly harmonised, tended to inspire the confidence so widely given him, both by friends and patients. He could and did speak out when occasion arose. If he felt he had been in error he freely owned it, and if he failed in any contention where he knew himself to be right he surpassed the vast majority of humans in his total lack of vindictiveness. His death is a grave loss to his profession, his hospital and school, and all his personal friends, in whom he inspired both affection and respect.

JAMES STANLEY NEWTON BOYD, M.B., B.S. LOND., F.R.C.S. ENG.,

LIEUTENANT-COLONEL, R.A.M.C. (T.F.); SENIOR SURGEON TO CHARING CROSS HOSPITAL, ETC.

WE have already announced the death of James Stanley Newton Boyd, senior surgeon to Charing Cross Hospital, which occurred on Feb. 1st after a short illness.

Stanley Boyd was born in Shrewsbury May 18th, 1856, his parents being Major James Boyd, 86th Regiment, and Emma, daughter of Henry Newton of Shrewsbury. His boyhood was spent at St. Heliers in Jersey, where his parents resided, and he began his medical education at University College, London, in 1872. Here he had a distinguished academic career, and many of his contemporaries came later to occupy very high positions in the medical profession. We may instance Sir A. Pearce Gould, Mr. A. J. Pepper, Sir Victor Horsley, Mr. C. J. Bond, and the late Colonel Stonham, whose death occurred on the same day, and whose obituary we publish this week. He was house physician to Wilson Fox and house surgeon to John Marshall, and was, no doubt, much influenced by the latter's teaching, especially in the application of scientific investigation to the practice of surgery. Boyd, like others of his date, owed much of his subsequent success to that disciple of Lister and Billroth, Marcus Beck, whose teaching of the science and the art of surgery was an outstanding feature of University College Hospital at that time. He passed his examinations with honour to himself and his medical school, taking the gold medal in anatomy at the first M B. at London University, and honours in his final M.B., B.S. in medicine and obstetrics in 1879. He became F.R.C.S. Eng. in 1881. After graduating he became demonstrator of anatomy and later of practical surgery in the medical school, and surgical registrar in the hospital. The experience acquired in the last post had a great influence on his future career. By conscientious devotion to the duties of this office he laid the foundation of his thorough knowledge of pathology and of its important bearings in surgical practice. It enabled him to describe precisely the details of an operation and also of any subsequent microscopic investigation. In later life he would often refer to the value which such an appointment is to a young surgeon if he takes full advantage of its opportunities.

In 1882 Boyd was appointed assistant surgeon to Charing Cross Hospital, and it was soon evident that he was an acquisition to the anatomical and surgical teaching of the hospital. He became full surgeon in 1891, and since 1905 he had been senior surgeon to the hospital. In the interval he held most of the important posts at the hospital and its attached school. He was lecturer on anatomy from 1888 to 1897, pathologist from 1886 to 1888, dean of the school from 1890 to 1895, lecturer on operative surgery from 1899 to 1901, and lecturer on surgery from 1896 to 1905. His lectures both in anatomy and surgery were remarkably thorough. He was treasurer to the school in 1906, holding the post till 1911 during a most critical period of the school's history. As chairman of the medical committee of the hospital and of the school committee, he showed much zeal and devotion in forwarding the interests, welfare, and progress of both, always bearing in mind that the benefits were mutually reciprocal. Though not an athlete himself, he was a great believer and supporter of athletics as a means of improving the *moral* and character of a school of the University.

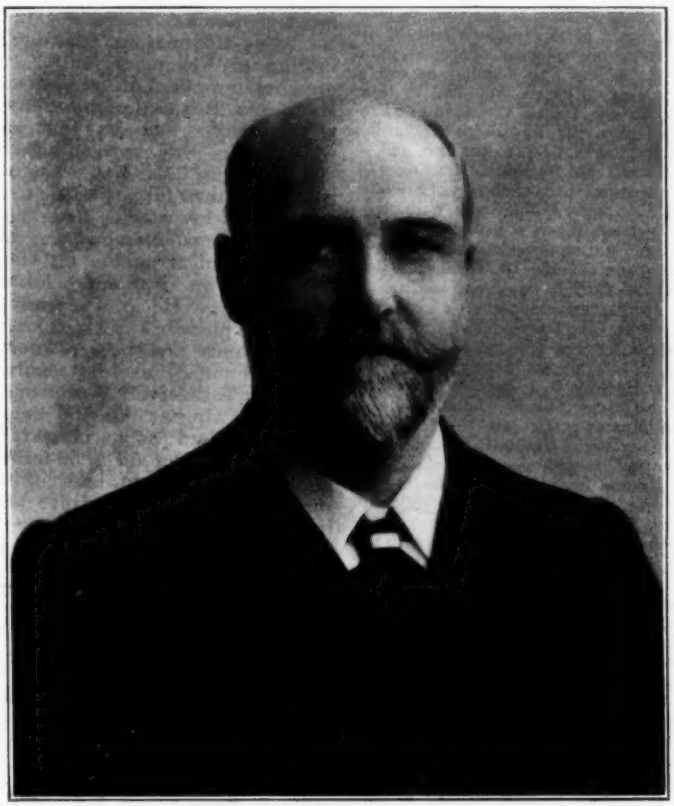
Despite his responsible duties at the Charing Cross Hospital Boyd found time to hold other appointments with credit to himself and benefit to others. At the time of his death he was surgeon to the Hospital for Consumption and Diseases of the Chest, Brompton, and consulting surgeon to Paddington Green Hospital for Children and to the New Hospital for Women, while he was also on the honorary staff of certain suburban hospitals. Since the beginning of the war, in addition to his multifarious hospital and arduous private work he had been attending and operating daily at the 4th London General Hospital in his capacity of Lieutenant-Colonel R.A.M.C. (T.F.) and a member of the *à la suite* staff. He was elected upon the Council of the Royal College of Surgeons of England in July, 1914, having previously been a member of the Court of Examiners. He examined also in surgery at the University of Cambridge.

Stanley Boyd wrote no treatise on surgery bearing his name, although his wide pathological, clinical, and practical knowledge would have justified him in such an undertaking. But he was frequently asked to supervise the work of others, and in this way he was chosen to edit the twelfth edition of Druitt's "Vade-Mecum" in 1887, and also the seventh edition of the well-known work "Pathology and Morbid Anatomy" of his old friend and colleague at Charing Cross Hospital, Dr. T. H. Green. He also wrote articles in Heath's "Dictionary of Surgery" ("Hospital Mortality and Hospitalism"); in Quain's "Dictionary of Medicine" ("Diseases of Mouth, Tongue, and Veins"); in Treves's "System of Surgery" ("Fractures"); in "Encyclopædia Medica," vol. i. ("Aneurysm"), and made many informing and lucid contributions to medical journals and to the proceedings of medical societies. Amongst which may be named a paper read at the Royal Medical and Chirurgical Society in 1893 on "Artificial Anus treated by Resection and Enterorrhaphy by Maunsell's Method," and others on "Oöphorectomy in Cancer of the Breast," in 1897, and on "Cancer of the Tongue, Mouth, and Fauces," with W. H. Unwin, in *Practitioner* in 1903. He was, moreover, a brilliant operator, bold but always careful, and experienced in every branch of surgery. He was keenly interested in the operative treatment of malignant disease, especially where the breast or mouth or fauces were involved, and his success in radical operations for these conditions was in some measure due to his expert anatomical knowledge. The best tribute to his skill may perhaps be estimated by the number of his

colleagues who owe him a deep debt of gratitude for his professional services either to themselves or members of their family.

Boyd was a man of very high principles. Beneath a rather reserved and, to some people, matter-of-fact manner there lay a very sincere warm-hearted nature, ever ready to rejoice with his friends in their success and to show active and generous sympathy in distress. He hated all sham and hypocrisy and had no use for slackers or slackness in work, and this soon became appreciated by the students, and when acting as dean he applied these principles in the interest of the school.

Some of Boyd's professional and social convictions were not always accepted at first, but later events have shown that he was a far-seeing man. In the early days of the Women's School of Medicine he was a lecturer on anatomy, and much of the success of that school was due to him. He had the courage of his convictions and never failed to advocate the claims of women to be admitted to the examinations of the Colleges and Universities. Like all pioneers in this movement, he became unpopular in some quarters for a time. On the difficult subject of the proper development of the University of London he had very definite views. He was among those who hold that the best way to reorganise the University of London as a teaching centre, as far as medicine is concerned, would be to concentrate in a few centres the instruction in the preliminary sciences, and much of the success which has now come to Charing Cross Hospital Medical School by its amalgamation for that purpose with King's College, could have been effected years ago had the counsels of Stanley Boyd been adopted. Over 20 years ago he advocated in the public press that Charing Cross Hospital should be removed to a suburb south of the Thames. This led to much opposition, but his project has quite recently been adopted by a neighbouring hospital, showing that the policy had at the time much to be said for it. He was indeed a man with a broad outlook, and willing to work hard and to submit to much criticism for the sake of his fine ideals. In 1889 he married Florence Nightingale Toms, M.D., who became surgeon to the New Hospital for Women and subsequently held the post of lecturer on gynæcology at the Royal Free Hospital. At her death in 1910 she was senior surgeon at the New Hospital and was acknowledged to be a skilful surgeon and clinician. Stanley Boyd had a true helpmate in his wife, and her death made a great difference in his life. His mother and one sister survive him.



JAMES STANLEY NEWTON BOYD.

[Reproduced from a photograph by Rita Martin.

Dr. Amand Routh writes:—

Having entered University College Hospital as a student in 1873, the year following the entry of Stanley Boyd, and with similar sequence having joined the staff of Charing Cross Hospital in 1883, I have had almost daily opportunity of appreciating his personal integrity and professional uprightness and skill during over 40 years. The late Montague Murray, F. W. Mott, and the late C. J. Arkle soon joined us as assistant physicians at Charing Cross Hospital, coming also from University College, and we worked in perfect harmony. Boyd laboured with disinterested zeal for the welfare of the students both during their hospital career and afterwards, and there was keen competition to become his house surgeon. His advice was sought and usually accepted by both colleagues and students, and his surgical opinion and help were similarly coveted in personal emergencies. His friendship was deep and true, demonstrated mainly by acts of unselfishness, and his sympathy was genuine, but not on the surface: it was sometimes only realised when his help was being utilised in a crisis. He never failed one in emergency, and his counsel was so sound, so generous, and so clearly expressed that it always helped to clarify the outlook and lighten the difficulties of the situation.

As an instance of his unselfish impartiality I well remember how he acted when the obstetric physicians sought permission to perform all gynæcological operations upon their own cases. Most of the major operations had hitherto been in the hands of the surgeons, Boyd especially doing the bulk of the abdominal work. As soon as he realised that gynæcology was becoming a surgical specialty he helped to have all such surgical restrictions removed, although he knew, and so stated, that the change would inevitably lead to the majority of major gynæcological operations going to the special rather than to the general wards. The unexpected death of Stanley Boyd has startled and distressed his old friends more than any professional loss since the death of Montague Murray in 1907. Their characters and lives were very similar, and their outlook on this world and the next was governed by a deep but unostentatious piety which controlled all their actions. Such men as these exert an enormous influence upon the heart of a medical school, and their places will be difficult to adequately fill.

Dr. Harrington Sainsbury writes:—

As one of Stanley Boyd's oldest friends, may I be allowed a little space in which to attempt a brief record of the man as I knew him? Our friendship began over 40 years ago at University College, London (he had come up to London from Jersey in 1872); it continued without a break and in close association until his death. Marcus Aurelius devotes the first chapter of his "Thoughts" to the several personalities which came into his life, and he ends up: "To the gods I am indebted for having good grandfathers, good parents, a good sister, good teachers, good associates, good kinsmen and friends, nearly everything good." Boyd's debt to the heavenly powers was a like one. I can go back to the charm of his Jersey home at St. Heliers, and recall happy memories of a visit there when the circle was still complete, Major and Mrs. Boyd, a younger sister and brother forming that circle; and I can see there, in the simplicities and integrities and unaffected enjoyment of life which prevailed, the natural source of the qualities which characterised and adorned him. It was a military home where duty figured largely and cheerfully, and it has always seemed to me that in consequence Boyd retained much of the soldier's outlook all through his life: this impression has been deepened since the war began. When Boyd came to London he saw a great deal of his uncle, Henry Newton, who had by then retired from a judgeship in the Indian Courts after a distinguished career in that country. Mr. Newton, who regarded him almost as a son, had a great influence over him, and to that influence on the spiritual side of things much may be traced, in particular his sympathies with the Society of Friends. A great friend of his at University College was William S. Tuke, the prognostics of whose life were brilliant, but the "dark economy of heaven" did not see fit to fulfil them here. Through him Boyd came to know Dr. Hack Tuke and his family, of long-established Quaker origin and traditions; here he found kindred sympathetic influences and friendships which endured. Among his contemporaries at University College, with whom he was associated, whom he influenced, and by whom in turn he was influenced, I would name in particular Victor Horsley, C. J. Bond of Leicester, Dawson Williams, Arthur Quarry Silcock, Amand Routh, F. W. Mott, Montague Murray; the last three became colleagues of his at Charing Cross Hospital. Amongst his teachers at University College Hospital one name stands out pre-eminently, that of Marcus Beck, a man who figured chiefly in his influence upon others and in the affectionate remembrance which he implanted.

From about 1880 onwards began his connexion with the London School of Medicine for Women, to which, in the chivalrous way which was his wont, he gave without stint time and labour; here, as always, recognising one standard only for himself as for others—namely, the highest. Many friendships had their origin in this school, and here he found, as his great reward, his wife, Florence Nightingale Toms. They were married in 1889, and with his marriage began the happiest and fullest period of his life, for the two were united not only by the bonds of affection, but by an exceptional community of tastes, interests, and ideals; they were husband and wife and at the same time true comrades. Mrs. Boyd died in 1910, to the sorrow of all who knew her, to his grief before all. Henceforward he continued to work with the same thoroughness but not with the same incentive, for joys could no longer be doubled, sorrows halved. He left special directions that his funeral should follow as far as possible, in all details, the funeral service of his wife, and if this was departed from by the introduction of a military element, it was done so after full consideration and in the belief that Mrs. Stanley Boyd would have welcomed the departure, proud of the work which he had given to his country in its hour of need. His mother and sister, who have lived with him since his wife's death, may well be proud of him and herein find their truest consolation.

FRANCIS GETHIN HOPKINS, M.D., B.CH. DUB.,

LIEUTENANT, R.A.M.C.; LATE PRINCIPAL MEDICAL OFFICER, GOLD COAST COLONY.

Francis Gethin Hopkins, who died at Plymouth on Feb. 2nd in his fifty-first year, was the son of the late Rev. J. W. Hopkins, of Ahern, Fermoy. He received his medical education at Trinity College, Dublin, and graduated M.B., B.Ch., B.A.O. in 1889, taking the M.D. degree in 1903. He entered the West African Medical Service in 1894, and was in succession medical officer of health for Lagos, deputy principal medical officer at Accra, and principal medical officer of the Gold Coast Colony. He was also a member of the Gold Coast Administrative Executive Council. In September, 1915, he retired from the Colonial Service and joined the Royal Army Medical Corps, being attached to the troops at the Citadel, Plymouth. Dr. Hopkins leaves a widow and four children.

EDGAR HOWARD LAKE.

Edgar Howard Lake, whose death at the early age of 29, as the result of a street accident, occurred on Jan. 19th, was a man whose career in medicine, though only just opening, was replete with guarantees of accomplishment. Starting medicine later than most men, Mr. Lake matriculated at London University in 1911, and obtained 1st Class Honours in Anatomy at the B.Sc. examination in November, 1914. He had gained an unusual number of prizes and distinctions at Middlesex Hospital, where he was demonstrator of anatomy; and at the time of his death was on his way to complete his final medical examinations. Mr. Lake was an enthusiast with a mind attuned for research; a man who, possessing a far wider knowledge than that with which most men enter medicine, had the additional advantage of a mechanical genius for the creating of instruments and an acute appreciation for the exactness of methods. He was already engaged upon an extensive piece of research connected with the size of the palate and overcrowded dentitions which promised most useful results. Mr. Lake had travelled extensively in Europe, was a member of the Swiss Alpine Club, and had a remarkably good climbing record; as a student in London he thought little of starting on a 50-mile walk during the night. On the outbreak of war he joined the Officers Training Corps, into the life of which he infused his invariable keenness; and upon qualification, which was so tragically frustrated, he intended to join the army.

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

THE WEEK'S SUBSCRIPTIONS.

THE subscriptions to the Belgian Doctors' and Pharmacists' Relief Fund received during the week have been as follows:—

	£	s.	d.
Mr. J. Lynn Thomas, C.B.	5	0	0
Association of Medical Women in India (per Dr. M. O'Brien)—			
Dr. Mackenzie	1	0	0
Major Godkin, I.M.S. ...	4	0	0
Mr. A. Chapman, proceeds of dependants' prescriptions	0	10	2
Liverpool Chemists' Association (collected by Mr. W. P. Evans)			
The late A. S. Buck ...	1	1	0
G. Inman	1	1	0
H. Humphreys Jones	0	10	6
W. R. Evans...	1	1	0
Collected by Mr. A. W. Ashcroft—			
G. Kennedy...	0	10	6
A. W. Ashcroft	0	6	6
J. W. Hawley	0	5	0
— Cluett	0	5	0
— Emlyn	0	5	0
E. B. Brigham	0	2	6
Osborne Hughes... ...	0	2	6
D. Prysor Jones	0	2	6
— Wright	0	2	6
Collected by Mr. L. V. Angel—			
J. Girvan	0	5	0
G. Nelmes	0	5	0
L. V. Angel	0	5	0
Miss A. Singha	1	0	0
Australian Pharmaceutical Conference (per the Agent-General for Queensland) (total, £986)	127	0	0

Subscriptions to the Fund should be sent to the treasurer of the Fund, Dr. H. A. Des Vœux, at 14, Buckingham-gate, London, S.W., and should be made payable to the Belgian Doctors' and Pharmacists' Relief Fund, crossed Lloyds Bank, Limited.

The War.

THE CASUALTY LIST.

THE following medical officer appears among the casualties announced since our last issue:—

Wounded.

Lieutenant N. A. Scott, R.A.M.C.

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our lists of those who have fallen during the war:—

Second Lieutenant G. D. Murray, 12th Battalion Northumberland Fusiliers, son of the late Dr. W. D. Murray, of Clapham Common, London, S.W.

Lieutenant J. S. Reed, 1st Buffs, attached to the Royal Flying Corps, only son of Dr. J. S. Reed, of Gorleston, Suffolk.

Lieutenant C. W. Turton, 6th Royal Sussex Regiment (T.F.), younger son of Mr. J. Turton, F.R.C.S., of Brighton.

THE EMPLOYMENT OF WOMEN IN MILITARY HOSPITALS.

The replacement of male by female labour when this is physically possible has reached its logical conclusion in the new regulations issued for the employment of women in military hospitals. These have been drawn up in consultation with the Joint Voluntary Aid Committee and concern two main classes of women:—1. General service women. 2. Labour staff, both of which will be engaged by the officer commanding, in the former case in coöperation with the county director. Women living in their homes in the vicinity of the hospital will be given preference, but where sufficient of these are not available the Aid Committee will be asked to obtain offers from further afield.

The Conditions of Employment as far as they Concern the First Class, the General Service Women.

1. *Classification.*—The following classes are marked out: (*a*) Clerks on ordinary clerical work, including typists; telephonists; laboratory assistants (untrained) (including X ray attendants); storekeepers. (*b*) Women with special technical qualifications requiring previous training, such as dispensers, head cooks, assistant cooks, trained laboratory assistants. (*c*) Head clerks, including the head clerk appointed as the general service superintendent.

2. *Rates of wages.*—Remuneration for the various classes will be as follows: (*a*) Inclusive weekly wages ranging from 20*s.* to 26*s.* (*b*) Dispensers will receive inclusive weekly wages ranging from 40*s.* to 45*s.* in the case of those possessing both the major and minor pharmaceutical certificates; from 28*s.* to 30*s.* in the case of those possessing only the Apothecaries' Hall certificate. Head cooks 20*s.* to 25*s.* a week plus meals if non-resident; £30 to £40 a year plus meals if resident. Assistant cooks 16*s.* to 18*s.* a week plus meals if non-resident; £20 to £25 a year plus meals if resident. A laboratory assistant (trained) an inclusive weekly wage of 26*s.* to 30*s.* (*c*) Head clerks will receive inclusive weekly wages ranging from 26*s.* to 33*s.*; the general service superintendent 33*s.* to 35*s.*

The wages and wage limits stated above for all classes are intended to cover all time worked, and are based on the understanding that no food or quarters are provided except where otherwise stated. They will apply to all service, whether probationary or not. Dinner and tea will be provided where desirable at the hospital, in which case a deduction of 5*s.* a week will be made from the weekly wages of the women concerned.

3. *Uniform.*—General service women will be required after the completion of their probationary period to provide themselves with the regulation Voluntary Aid Detachment uniform. Towards this an allowance of £4 will be given on signing the agreement.

4. *Probation and agreement.*—General service women will be appointed on probation for one month. Their services, if not deemed satisfactory, may be dispensed with immediately at any time during the period of probation. On the termination of the probationary period they will be required to sign an agreement for service for a period of 12 months or the duration of the war, whichever is less. The form of agreement will include a clause empowering the officer commanding to terminate the agreement at any time on giving, in general, one month's notice, and in the case of unsuitability or incompetence one week's notice.

5. *Travelling expenses.*—In cases where a certificate is received from the Joint Voluntary Aid Committee that a woman has had to travel by rail on first joining the hospital, necessary travelling expenses, including third-class rail fare, will be refunded by the officer commanding.

6. *Regulations.*—All general service women employed in a hospital will be under the control of the officer commanding, and will be dealt with as regularly employed persons under the regulations for civilian subordinates, except where otherwise specially provided for. General service women will be dealt with under the provisions of Section 47 of the National Health Insurance Act. Medical attendance in cases of ordinary illness is normally provided by panel doctors, but there is no objection to the provision of medical attendance for general service women by the hospital where the officer commanding considers this desirable.

7. *Establishments.*—Where general service women are employed a general service superintendent should be appointed; where one or more head clerks are employed one of them must be selected to act as general service superintendent at the same time. Head clerks may be appointed where necessary, but not exceeding one (including the head clerk acting as general service superintendent) to five women clerks. Head cooks may be appointed where it is found necessary to have a skilled woman in charge of the trained cooks, but not more than one may be appointed to each kitchen.

8. *Discipline.*—The general service superintendent will, under the control of the officer commanding, be responsible for the discipline and general welfare of the general service women, except those working inside the wards, who, while so employed, will be under the supervision of the matron.

9. *Women already engaged.*—Women who have already been engaged under other terms may retain their rates and conditions where more favourable; but where the officer commanding considers it necessary to bring them under the new terms and conditions he may do so after giving reasonable notice.

We have given these conditions of employment at length, as the service is one which will appeal with especial force to the wives, sisters, and daughters of medical men and to other women who take a special interest in hospital work. We understand that there are already over 2000 Voluntary Aid workers employed on general service, and that the demand for trained dispensers is at present greater than the supply.

DISTINCTIVE UNIFORMS FOR MEDICAL OFFICERS.—A Swiss correspondent writes: "The large number of doctors of all nationalities figuring among the killed and wounded has formed the subject of a special investigation by Professor Combe, the Lausanne surgeon. Dr. Combe discussed the question with French and German military doctors alike, and on the information thus acquired has formed the conclusion that the high percentage of such losses is due to the fact that in all the armies the uniforms of medical men resemble those of the combatants, and that it is impossible to discern any difference between them from a distance. In his report, which is now being considered by Swiss medical associations, Dr. Combe proposes, in agreement with many eminent French, German, and Austrian doctors, that doctors belonging to all the armies should wear similar uniforms, extremely vivid and visible in character.

Blue, he says, is the colour most likely to appeal to Swiss doctors, but it might possibly be confounded with the uniforms of various branches of the French army, while the white uniform would be easily seen in summer but invisible in winter against a background of snow. Dr. Combe favours the red uniform for all military doctors and urges the Lausanne medical association to formulate proposals on the point to be submitted to the different Governments."

TRAINING OF BLINDED SOLDIERS.—There is a proposal in Edinburgh to provide facilities for the housing and training in useful occupations of Scottish soldiers who have lost their eyesight on the field of battle. At the present the military authorities are arranging that all blind soldiers shall be retained in London, where arrangements will be made for their welfare and training in suitable employment, but it is urged that the Scottish capital has a right to look after the Scottish blinded soldiers, and it is pointed out by the promoters of the scheme that facilities for their special training are already in existence in Edinburgh. The Royal Blind Asylum at Craigmillar is said to be thoroughly adequate for undertaking this commendable work for our stricken soldiers. These views have been put before the Lord Provost, Sir Robert Inches, by the Rev. Dr. Burns, chairman of the board of directors of the Royal Blind Asylum, and Mr. John Laing. The Lord Provost expressed his approval of the project and promised his support for it, and the directors of the institution will now consider the general lines on which they should proceed.

A BRITISH HOSPITAL FOR CORFU.—Arrangements are being made for the immediate despatch of an advance party for Corfu with the object of opening a British hospital there. This will make the seventh hospital organised by the Serbian Relief Fund. Mr. E. P. Warren, the well-known architect, has been appointed administrator of the hospital.

THE AMERICAN WOMEN'S WAR HOSPITAL AT PAIGNTON.—We have received the second report[1] of this hospital dealing with the second thousand cases treated there. These cases were discharged between April 3rd and Dec. 8th, 1915. The analysis reveals the same general distribution of medical and surgical cases as was noted in the previous report, but differs from it in a few interesting points. The figures of the first report are printed in brackets for comparison. There were more wounds, 547 instead of (445), but almost exactly the same number, 252 (254), were infected, none (2) with tetanus, 2 (0) with the gas bacillus. Only 13 (19) amputations and re-amputations were performed. The cases of frost-bite were much reduced, 18 (144). Infective medical cases were more numerous, 93 (60), dysentery accounting for 43 (0) of these. Of non-infectious conditions, debility with 48 and gas-poisoning with 28, now head the list. Only 5 (3) patients died. The average stay in hospital was 38·3 (22·8) days. 72 (35) were invalided out of the service; 52 (54) transferred to other hospitals. The patients arrived in 14 convoys, 230 of them in four batches from the Dardanelles. The two units detailed for service in Great Britain by the American National Red Cross Society having been recalled on Oct. 1st, 1915, after having completed a year's service, two of the Red Cross surgeons, Dr. D. Pearce Penhallow and Dr. James E. Daniel remained, and the staff was completed by the appointment of five more American surgeons. There is now an English matron and the nursing staff is composed of English and American sisters.

RED CROSS SALE.—The amount realised at the supplementary sales of gifts in aid of the Scottish Branch of the Red Cross Society, held in Dowell's Rooms, Edinburgh, recently, inclusive of contributions in cash, was £1530 5*s*. 7*d*. The amount previously intimated as the result of the sales held at the same place in the beginning of December last was £5476 18*s*. 10*d*., making the total raised by these sales £7007 4*s*. 5*d*.

RED CROSS HOSPITAL FOR SOMERSET.—The Shepton Mallet (Somerset) workhouse is to be fitted up as a county Red Cross Hospital, and 210 patients are to be admitted.

[1] The first report was noticed in THE LANCET of Oct. 23rd, 1915, p. 949.

OBITUARY OF THE WAR.

HENRY BRIDGE YATES, B.A. CANTAB., M.D., C.M. McGILL,

LIEUTENANT-COLONEL, C.A.M.C.

THE Canadian Army Medical Corps has sustained a severe loss through the untimely death of Lieutenant-Colonel H. B. Yates, second in command of No. 3 Canadian General or McGill University Hospital, in whom an acute attack of influenza in the late autumn was followed by cardiac weakness with its attendant pulmonary congestion and the too familiar syndrome.

Henry Bridge Yates, fourth son of the late Henry Yates of Brantford, Ontario, was born in Montreal on May 10th, 1865. He was sent to Charterhouse, and remained throughout his life a devoted Carthusian. From school he proceeded to Jesus College, Cambridge, obtaining his B.A. in 1888. For his medical course he returned to Canada, graduating M.D., C.M. at McGill University in 1893. Possessed of private means, and having been left by his father interest in several undertakings in Brantford which demanded periodic visits to that town, Dr. Yates did not enter upon private practice. Shortly after graduating he spent several months in Germany studying bacteriology, and upon his return was appointed demonstrator in bacteriology at McGill University, subsequently being made lecturer. With this he became increasingly interested in matters of public health, and as a result from 1906 to 1910 he served as Alderman of Montreal, as such being the leading member of the Hygiene Committee and head of the Fire Department. The same public spirit led him to be keenly interested in the classes of the St. John Ambulance Association. For many years he was lecturer and examiner, eventually becoming President of the Provincial branch of this Association, and in recognition of these services he was appointed a Knight of Grace of the Order of St. John of Jerusalem. Similarly, upon the death of Colonel Jeffrey Burland shortly after his appointment as Canadian Red Cross Commissioner in England, Colonel Yates became President of the Province of Quebec Branch of the Canadian Red Cross Society, and he and Mrs. Yates threw themselves into the direction of the war activities of this Society. At an early period he became attached as Medical Officer to the Victoria Rifles, then the foremost Militia Regiment in Montreal. At the reorganisation of the Canadian Army Medical Corps in 1907, with the present Director of Medical Services, General Carleton Jones, he threw himself actively into the work of the corps, so that when war was declared he was appointed acting A.D.M.S. for the Montreal District, and in October, 1914, was promoted full Colonel.

With the organisation of the McGill or No. 3 Canadian General Hospital in February, 1915, Colonel Yates accepted the lower rank of lieutenant-colonel in the Expeditionary Force and joined the unit as second in command. His elder son had died suddenly two years previously shortly after being appointed to the Canadian permanent force at Halifax, and now the younger son elected to accompany his father as bugler to the unit. Lieutenant-Colonel Yates rapidly showed himself indispensable, and by his capacity and character gained not merely the respect but the affection of all ranks. He was a kindly, considerate, and delightful colleague, with no thought for himself—a true gentleman. Unquestionably he had overstrained himself in the organisation of the hospital buildings on the French coast, and when in the cold

spell of last November he was seized with influenza it left him with a heart so affected that there was from the first little hope that he would regain full health and activity.

In 1895 he married Alice Mary, only daughter of the late C. W. Bunting, of Toronto. The widow, a son, and a daughter survive him.

Lieutenant-Colonel J. G. Adami, F.R.S., of the Office of the Director of Medical Service, Canadian Expeditionary Force, writes: "The death of Harry Yates comes as a big blow to many far outside of medical circles, for he was a man of many friends. To the majority of medical men who knew him it is only the war that has brought a revelation of his sterling qualities over and above the social gifts with which he was eminently endowed. Belonging to a well-to-do family, and enjoying to the full a boyhood at Charterhouse, followed by pleasant years at Jesus, Cambridge, when that good old College was supreme on the river and in every order of sport, he never made a pretence of scholarship, and seemed to have turned to medicine purely from the desire to have some more serious object in life. My late colleague, Wyatt Johnston, and I encouraged him to take up bacteriology largely because of our personal liking for him, and because in the early nineties demonstrators who demanded no stipend and were likely to remain attached to the department were few and far between. When appointed he showed himself an excellent laboratory teacher, and, what is more, a splendid organiser of practical classes. Thus, despite the criticisms of those who knew him only as a leader of the social world in Montreal, he remained attached to my department for many years. The war brought all his good qualities into strong relief, whether as President of the Red Cross Association of the Province of Quebec, and at the same time of the St. John Ambulance Association, or as acting A.D.M.S. of No. IV. Division, or as adjutant to No. 3 General Hospital. His approachability, wise judgment, even temper, and knowledge of men and affairs, made him invaluable in each capacity. He showed himself, in short, the man for the occasion, and now can ill be spared."

ALFRED NOEL GARROD, B.A. CANTAB., M.R.C.S. ENG., L.R.C.P. LOND.,

LIEUTENANT, ROYAL ARMY MEDICAL CORPS.

Lieutenant A. N. Garrod, who was killed in France on Jan. 25th at the age of 29, was the eldest son of Dr. A. E. Garrod, Colonel, A.M.S., physician to St. Bartholomew's Hospital. He was educated at Marlborough and Emmanuel College, Cambridge, and entered as a student at the medical school of St. Bartholomew's Hospital in October, 1909. He qualified in 1914, was appointed house surgeon shortly afterwards, and received his commission as lieutenant, R.A.M.C. He was appointed to the 100th Field Ambulance and went to France in November, 1915. It is said of him that at St. Bartholomew's, when house surgeon, he was the life of the resident staff, always cheery and ready for work. He was possessed of an excellent physique and excelled at sport. His early and sudden death has cut short a life full of promise. The surgeon for whom he worked writes: "The news of Garrod's death came as a terrible shock. He was always so cheery and bright, always punctual and diligent in his hospital duties. It seems only the other day that I bade him farewell and good luck. His name will long be remembered at St. Bartholomew's. To his parents, who had previously lost one son in the war, the hospital tenders its deepest sympathy." The medical profession in general will unite in this sympathy.

Medical News.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At the Final Examination held from Jan. 11th to 26th the following candidates were approved in the undermentioned subjects:—

Medicine.—F. M. Allchin, Westminster; G. F. V. Anson, Cambridge and St. Thomas's; T. A. P. Benbow, Jefferson; A. W. C. Bennett, St. Thomas's; K. H. Bhat, Madras and Charing Cross; J. T. Bleasdell, Cambridge and Leeds; C. E. Bond, Cambridge and University College; C. V. Braimbridge, Cambridge and St. Bartholomew's; Isabel Florence Buckle, Royal Free; G. E. Chissell, Middlesex; Hester Mary Church, Royal Free; P. S. Clarke, St. Bartholomew's; D. Crellin, Cambridge and St. Bartholomew's; R. G. Dani, University College; A. R. K. Dina, Bombay and Guy's; G. G. Drummond, St. Thomas's; W. C. C. Easton, Manchester; W. F. Eberli, Cambridge and St. Bartholomew's; M. Elias, Cairo and St. Mary's; C. A. L. Evans, University College; G. I. Evans, Oxford and St. George's; S. W. Fisk, University College and Middlesex; A. R. Fuller, St. Mary's; C. H. Gilmour, Toronto and Middlesex; C. C. Goodall and E. A. Green, Cambridge and London; H. E. Griffiths, Cardiff and St. Bartholomew's; A. B. Gunaskara, Ceylon and King's College; T. H. Gunewardene, Ceylon and King's College; Hilda Mary Halliday, Royal Free; J. C. N. Harris, Cambridge and St. Thomas's; W. L. A. Harrison, St. Mary's; B. Haskins, Otago, Edinburgh and St. Bartholomew's; E. H. V. Hensley, Cambridge and St. Thomas's; E. L. Hopkins, London; W. A. Hotson, Westminster; Helen Ingleby, Royal Free and St. George's; G. G. Jack, Middlesex; T. H. Jackson, Charing Cross; F. B. Jago, Manchester; L. W. Jones, Cambridge and London; V. Kameneff, Moscow, Edinburgh, and University College; T. L. Kan, St. Thomas's; Ivy Keess, Bombay and Royal Free; C. E. Kindersley, Cambridge and St. Bartholomew's; R. P. Langford-Jones, University College; M. E. A. Latif, Cairo and Middlesex; H. Lewis, London; Louisa Margaret Lister, Bristol; D. Loughlin, University College; H. M. C. Macaulay, St. Bartholomew's; P. G. McEvedy, Guy's; G. A. S. Madgwick, London; R. H. Maingot, St. Bartholomew's; L. A. Malik, St. Mary's; P. S. Marshall, University College; G. L. Maule, Cambridge and Manchester; F. W. Maunsell, Cambridge and St. Mary's; A. D. Millington, Birmingham; T. D. Morgan, Cambridge and London; A. G. Morris, Bristol; B. Mountain, Cambridge and University College; S. Muttiah, London; K. V. Muttukumaru, Madras and London; N. R. Nalliah, Ceylon and London; J. D. Oliver, Dublin and Middlesex; May Olivera, Bombay and Royal Free; A. J. Orenstein, Jefferson; P. R. D. Pank, Cambridge and London; E. W. Paul, Calcutta and Royal Free; G. Perkins, Oxford and St. Thomas's; P. R. O'R. Phillips, Cambridge and St. Thomas's; R. R. Powell, Cambridge and St. Bartholomew's; D. S. Pracy, St. Bartholomew's; M. K. Robertson, Cambridge and St. Bartholomew's; G. C. Robinson, St. Thomas's; B. T. Rose, Birmingham; P. G. Russell, Middlesex; K. Sahib, Lahore and St. Thomas's; B. Sakoschansky, Westminster; W. H. Sarra, London; J. E. Scanlan St. Mary's; G. B. Sellwood, Cambridge and St. George's; Edith Annie Shaw, Royal Free; C. Shaw-Crisp, St. Mary's; N. A. Sprott, Oxford and St. Thomas's; Elsie Stansfeld, Royal Free; W. Steadman, University College; H. G. Stormer, St. Thomas's; A. Sunderland, Charing Cross; H. W. Taylor, London; Lily Dorothea Taylor, Royal Free; W. H. Thomas, Cardiff and St. Mary's; J. A. Tippet, St. Thomas's; H. M. von Mengershausen, Manchester; H. J. Wallace, University College; L. Walton, Manchester; H. A. Whyte-Venables, Cambridge and St. George's; R. W. Willenberg, Ceylon and Middlesex; G. C. Williams, Cambridge and Bristol; H. G. E. Williams, Cambridge and St. Bartholomew's; A. Wilson, University College; T. Wilson, Manchester; and L. Zeitline, Paris and University College.

Surgery.—A. W. Adams, Bristol; Mary Neville Andrews, Royal Free; G. F. V. Anson, Cambridge and St. Thomas's; K. D. Atteridge, St. Bartholomew's; A. J. Bado, St. Thomas's; K. L. Bates, Guy's; T. A. P. Benbow, Oregon and Jefferson; G. A. Beyers, St. Bartholomew's; K. H. Bhat, Madras and Charing Cross; J. T. Bleasdell, Cambridge and Leeds; E. S. Bowes, Guy's; A. O. Courtis, Cambridge and St. Bartholomew's; P. A. Dargan, St. George's; L. M. Davies, Oxford and St. Thomas's; L. ap I. Davies, University College; H. M. Drake, St. Thomas's; A. N. Drury, Cambridge and St. Thomas's; C. Y. Eccles, St. Thomas's; C. A. L. Evans, University College; D. J. Evans, Cardiff and Middlesex; L. W. Evans, St. Bartholomew's; M. D. Evans, London; W. J. Evans, Cardiff and University College; W. Farquharson, St. Mary's; G. Fehrsen, London; E. A. Fiddian, Cambridge and St. Bartholomew's; M. R. V. Ford, Sheffield; C. Gould, University College; H. E. Griffiths, Cardiff and St. Bartholomew's; C. G. W. Hahr, St. George's; A. E. Hamlin, Madras and St. Bartholomew's; G. C. Hartley, Birmingham; A. N. Haworth, Charing Cross; G. E. Heath, St. Bartholomew's; V. R. Hirsch, Guy's; E. L. Hopkins and G. P. B. Huddy, London; Helen Ingleby, Royal Free and St. George's; V. C. James, Middlesex; A. R. Jennings, Cambridge and St. Bartholomew's; S. H. M. Johns, Cambridge and St. Thomas's; W. G. Johnston, St. Mary's; J. G. Jones, Guy's; L. W. Jones, Cambridge and London; C. E. Kindersley, Cambridge and St. Bartholomew's; E. A. Leviseur, Guy's; H. Lewis, London; K. T. Limbery, St. Thomas's; G. A. S. Madgwick, London; R. H. Maingot, St. Bartholomew's; Gladys Mary Miall Smith, Royal Free; R. D. Moyle, Johns Hopkins and Charing Cross; K. V. Muttukumaru, Madras and London; H. M. Oddy, Oxford and St. Thomas's; P. R. O'R. Phillips and A. C. Pickett, Cambridge and St. Thomas's; D. S. Pracy, St. Bartholomew's; R. Rau-Damodar, Madras and Middlesex; D. Rees, Cardiff and University College; E. D. Richardson, Charing Cross; M. K. Robertson,

Cambridge and St. Bartholomew's; B. T. Rose, Birmingham; E. E. Samaraweera, Ceylon and King's College; J. T. Samuel, Cardiff and University College; Elisabeth Henrietta Schwab, Royal Free; C. P. Sells, Oxford and Middlesex; G. B. Sellwood, Cambridge and St. George's; Elsie Stansfeld, Royal Free; G. T. Symons and H. J. H. Symons, King's College; A. H. Taymour, Guy's; W. H. Thomas, Cardiff and St. Mary's; J. A. Tippet, St. Thomas's; R. S. Topham, Leeds; H. M. von Mengershausen, Manchester; Phillis Emily Webb, Royal Free; H. M. Wharry, Oxford and St. Bartholomew's; H. A. Whyte-Venables, Cambridge and St. George's; H. G. E Williams, Cambridge and St. Bartholomew's; A. Wilson, University College; R. S. Woods, Cambridge and St. George's; and G. C. N. Younger, Middlesex.

Midwifery.—G. C. Agarwala, London; A. M. Ahmad, Cambridge and Guy's; J. Andrews, St. Bartholomew's; G. F. V. Anson, Cambridge and St. Thomas's; H. Archer, Bristol; A. Arias, St. Bartholomew's; T. B. Bailey, Cambridge and St. Bartholomew's; T. A. P. Benbow, Jefferson; F. E Bendix, Middlesex; H. J. Benstead, Guy's; C. E. Bond, Cambridge and University College; E. G. P. Bousfield, St. Bartholomew's; I. R. R. Brogden, Cambridge and Guy's; W. W. K. Brown, St. Thomas's; H. S. Bryan, London; L. J. F. Bull, St. Bartholomew's; H. R. Buttery, Cambridge and St. Bartholomew's; H. H. Castle, L. A. Celestin, and A. H. Clarke, St. Thomas's; P. S. Clarke, St. Bartholomew's; A. A. Cockayne, Cambridge and St. Thomas's; W. H. Coldwell, Westminster; J. D. Constantin, St. Bartholomew's; G. F. Cooke, Ceylon and St. Bartholomew's; M. C. Cooper, London; L. Cunningham, Cambridge and St. Bartholomew's; R. C. Davenport, St. Bartholomew's; A. V. S. Davies, St. Mary's; F. G. L. Dawson, London; M. A. B. Demerdash, University College; A. B. Dummere, London; W. H. Dye and J. D. Dyson, Middlesex; A. W. F. Edmonds, Westminster; H. E. Ekanayake, Ceylon and Middlesex; M. Elias, Cairo and St. Mary's; H. S. Evans, Cambridge and St. Thomas's; T. S. Evans, Cardiff and St. Mary's; F. O. Fehrsen, London; E. A. Fiddian, Cambridge and St. Bartholomew's; M. R. V. Ford, Sheffield; Marjorie Ellen Franklin, Royal Free; A. R. Fuller, St. Mary's; D. H. A. Galbraith, Guy's; G. T. Garraway, University College; L. S. Gathergood, Cambridge and Guy's; E. L. Glasier, Manchester; H. E. Griffiths, Cardiff and St. Bartholomew's; Ethne Haigh, Durham; N. H. Harrison, Charing Cross; B. Haskins, Otago, Edinburgh, and St. Bartholomew's; A. N. Haworth, Charing Cross; J. A. Hill, London; G. Hoffmeister and W. O. Holst, Middlesex; W. A. Hotson, Westminster; J. B. Hume, St. Bartholomew's; Helen Ingleby, Royal Free and St. George's; Elizabeth Ethel Jenkins, Royal Free; T. Joekes, Leiden; P. T. Jones, Cardiff and University College; W. H. Jones, St. Mary's; H. Lewis, London; N. M. Lewis and E. E. Lightwood, Westminster; Annie Lloyd, Royal Free; D. Loughlin, University College; L. G. Lunnon, Middlesex; H. M. C. Macaulay, St. Bartholomew's; L. A. Malik, St. Mary's; W. Marriott, St. Thomas's; P. S. Marshall, University College; J. A. Martin, Cambridge and Guy's; F. C. Mason, Middlesex; Adeline Mabel Matland, Royal Free; B. H. Mellon, National University, Dublin; Gladys Mary Miall Smith, Royal Free; H W. L. Molesworth, London; E. C de M Morgan, Guy's; R. Moser, St. Bartholomew's; E. W. Mottau, Ceylon and University College; G. Moulson, St. Thomas's; D. M. Moir, Cambridge and St. Bartholomew's; J. J. Murphy, London; F. P. Nicholas, Cambridge and St. George's; D. C. Norris, London and Charing Cross: Alice O'Reilly, Calcutta and Birmingham; J. A. P. Perera, Ceylon and London; Enid Maud Pfeil, Royal Free; V. Philippe, Brussels; E. S. Phillips and R. L. Portway, Guy's; J. S. Ranson, Westminster; C. Y. Roberts, St. Thomas's; M. K. Robertson and J. D. Rutherford, Cambridge and St. Bartholomew's; R. J. Scarr, Manchester; G. B. Sellwood, Cambridge and St. George's; R. G. Simpson, London; D. M. Smith, Bristol; Elsie Stansfield, Royal Free; G. P. Tatton, London; W. H. Thomas, Cardiff and St. Mary's; R. O. Townend, London; H. M. von Mengershau-en, Manchester; O. Williams, Cardiff and University College; A. G. P. Wills, Cambridge and St. Thomas's; A. Wilson, University College; J. H. Wiseman, Sheffield; and C. Young, University College.

THE ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—The Faculty, observing the large number of those connected with the medical profession who are giving war service in various capacities, are desirous of encouraging others to follow the example. With that twofold object they have made an alteration in their regulations for the examination to the Fellowship of the Royal Faculty, which they consider will mark their sense of the value of war service, and will facilitate the entry of those who render adequate war service into the Fellowship without unduly lowering the standard of the qualification. The Fellowship of the Royal Faculty, an honours qualification, is open to registered medical practitioners of not less than two years' standing who pass an advanced examination in two of the principal subjects of medical science. The Faculty, having in view the value of the loyal and patriotic services which those who are engaged in the war are giving to the State, and the value of the experience they are likely in this way to acquire, have resolved that in their case an examination in one of these subjects in place of two shall be accepted as sufficient.

ROYAL MICROSCOPICAL SOCIETY.—The next meeting of this society will be held on Wednesday, Feb. 16th, at 8 P.M., at 20, Hanover-square, W., when a communication will be made by Mr. E. Heron-Allen, Mr. A. Earland, and Mr. C. F. Rousselet on the Progress and Development of Vision and Definition under the Microscope. There will be a representative series of microscopes from the society's collection on view. There will also be a demonstration by Mr. J. E. Barnard, entitled "An Experiment with the Ultra-Microscope." The programme promises to afford an excellent commentary upon the history of microscopy.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the committee 20 cases were considered and £149 10*s.* voted to 15 of the applicants. The following is a summary of the cases relieved:—

Widow, aged 56, of M.D. Aberd. who practised at Balham and died in 1904. After husband's death went to South Africa with her son and invested all her capital in a mine, which was a failure. Applicant returned to England at the outbreak of war. Son joined the army in South Africa, and the little allowance he was able to make to his mother ceased. She has earned a little by nursing, but not sufficient to keep her. Relieved once £10. Voted £5 and referred to the Guild.—Widow, aged 42, of M.R.C.S. Eng. who practised in London. Has three young children. Has endeavoured to make a living by running a boarding house, but owing to ill-health and the children has found it very difficult, and required a little temporary help. Voted £10.—Wife, aged 39, of a professional man who had joined the army. Applicant's first husband was a medical man, and had three daughters by him. She has developed tuberculosis, and had to go into a sanatorium, and wanted a little help to complete the education of her youngest daughter, aged 16. Another society has promised a little help. £2 10*s.* was granted to the Guild who were also going to assist.—Daughter, aged 49, of M.D. Lond. who practised in London and died in 1900. Was left practically unprovided for, and is very delicate. Only income £19 per annum. For many years lived with a friend who has recently died. Relieved twice, £25. Voted £15 in 12 instalments.—Daughter, aged 63, of M.R.C.S. Eng. who practised in Watford, and died in 1879. Applicant unable to work in consequence of impaired health. Only income a pension of £26 from another society. Relieved nine times, £108. Voted £9 in 12 instalments.—Daughter, aged 51, of M.R.C.S. Eng. who practised at St. Clears, and died in 1878. Applicant has double curvature of the spine. Lives with a mother who is an annuitant of the Fund. Relieved twice, £12. Voted £6 in 12 instalments.—Widow, aged 63, of M.R.C.S. Eng. who practised in London and Somerset, and died in 1901. Applicant was left quite unprovided for at husband's death. Has managed to earn a little by dressmaking and letting rooms, but has been ill, and recently underwent an operation for uterine fibroids. Relieved twice £24. Voted £12 in 12 instalments.—Widow, aged 65, of L.S.A. Lond. who practised in London, and died in 1890. Applicant has no permanent income, but earns a little by needlework and taking in boarders. Her health is very precarious. Relieved three times, £36. Voted £12 in 12 instalments.—Widow, aged 59, of M.R.C.S. Eng. who acted as locum, and died in 1913. Applicant was practically supported by eldest son, who gave up a good position and joined the army, but has been missing since September last. Other son also in the army, but only able to allow his mother the usual army allowance. Too old and health not good enough to enable applicant to work. Relieved twice, £20. Voted £12 in 12 instalments.—Widow, aged 51, of M.R.C.S. Eng. who practised in Leicestershire, and died in 1902. Applicant was the Morgan annuitant of the Fund for some years. Owing to three sons having joined the navy and army and not able to make the usual allowances towards the upkeep of the home and one daughter very ill, applicant has got into temporary difficulties. Voted £5.—Wife, aged 49, of L.R.C.P. Irel. Separated from her husband owing to his habits. Left with three children, the youngest of whom is at Epsom College, and the others hope to be able to earn a little soon and help their mother. Applicant's eyes are bad and she is quite unable to work. Relieved three times, £36. Voted £12 in 12 instalments.—Widow, aged 59, of L.R.C.P. Irel. who practised at Chester and died in 1907. Applicant was left quite unprovided for, only certain income a pension from another society of £25. Health very unsatisfactory. Has one daughter who is married and unable to help. Relieved eight times, £96. Voted £12 in 12 instalments.—Daughter, aged 61, of M.R.C.S. Eng. who practised at Huntspill and died in 1889. Applicant has tried to make a living by letting rooms, but not successfully, and all her spare capital has been lost. Only income now a little from needlework. Relieved five times, £60. Voted £12 in 12 instalments.—Daughter, aged 45, of M.D. Heid., L.R.C.P. Lond. who practised in London and died in 1890. Applicant's health is very unsatisfactory. She earns a little by painting, but this is very precarious, especially at present. Relieved once, £12. Voted £10 in two instalments.—Widow, aged 70, of M.R.C.S. Eng. who practised at Maidstone and died in 1910. Applicant was left totally unprovided for, and has tried to earn a living by taking in paying guests, but recently has not been very successful, and is too old to try other work. Relieved five times, £42. Voted £12 in 12 instalments.

Subscriptions may be sent to the honorary treasurer, Dr. Samuel West, 11, Chandos-street, Cavendish-square, London, W.

Mr. Harold Low, M.A., M.B., B.C. Cantab., senior anæsthetist to St. Thomas's Hospital, has been appointed anæsthetist to His Majesty's Household.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

BULL, G. V., M.B., B.C. Cantab., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Hoddesdon district of the County of Hertford.

WILLOUGHBY, WILLOUGHBY MASON, M.D., D.P.H. Cantab., has been appointed Medical Officer of Health for the Port of London.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

BRISTOL ROYAL INFIRMARY.—House Physicians and House Surgeons. Salary at rate of £120 per annum, with board, apartments, and laundry.

COVENTRY AND WARWICKSHIRE HOSPITAL, Coventry.—Third Resident. Salary £175 per annum, with rooms, board, laundry, and attendance.

DEVONPORT, ROYAL ALBERT HOSPITAL.—House Surgeon, unmarried. Salary £150 per annum, with board and laundry.

EVELINA HOSPITAL FOR SICK CHILDREN, Southwark, S.E.—House Physician and House Surgeon. Salary at rate of £160 per annum, with board, residence, and washing.

HUDDERSFIELD ROYAL INFIRMARY.—Junior House Surgeon. Salary £100 per annum, with board, residence, and laundry.

LEEDS PUBLIC DISPENSARY.—Female Resident Medical Officer. Salary £130 per annum, with board, residence, and laundry.

LONDON LOCK HOSPITAL, Dean-street, Soho, W.—House Surgeon for six months. Salary at rate of £150 per annum.

MANCHESTER, BAGULEY SANATORIUM FOR TREATMENT OF TUBERCULOSIS.—Second Assistant Medical Officer, unmarried. Salary £250 per annum, with board and residence.

MANCHESTER CHILDREN'S HOSPITAL, Pendlebury.—Resident Medical Officer, unmarried, for six months. Salary at rate of £100 per annum, with bonus of £5 per month.

MARGARET-STREET HOSPITAL FOR CONSUMPTION (for Out-patients), 26, Margaret-street, Cavendish-square, W.—Temporary Assistant Honorary Physician.

NEW HOSPITAL FOR WOMEN, Euston-road, N.W.—Female Senior Clinical Assistants in Out-patient Department. Also Female Assistant Anæsthetists.

NORFOLK, DISS, 2/1ST HIGHLAND MOUNTED BRIGADE FIELD AMBULANCE, 2, Mount-street.—Three Medical Officers.

PRESTON, LANCS, COUNTY ASYLUM, Whittingham.—Locum Tenens, unmarried. Salary £7 7s. per week, with apartments, board, and washing.

ROYAL FREE HOSPITAL, Gray's Inn-road, W.C.—Curator of Museum. Also Radiographer and Medical Electrician. Salary £100 per annum.

ST. PETER'S HOSPITAL FOR STONE, &c., Henrietta-street, Covent Garden, W.C.—Junior House Surgeon for six months. Salary at rate of £75 per annum, with board, lodging, and washing.

SALFORD ROYAL HOSPITAL.—House Physician and House Surgeon. Salary at rate of £250 and £200 per annum respectively, with board and residence.

SUNDERLAND ROYAL INFIRMARY.—Female House Surgeon. Salary £150 per annum, with board, residence, and laundry.

WEST BROMWICH AND DISTRICT HOSPITAL.—Assistant House Surgeon, unmarried. Salary £120 per annum, with residence, board, and laundry.

WEST HAM AND EASTERN GENERAL HOSPITAL.—House Physician and House Surgeon.

WEST HAM UNION INFIRMARY, Whipps Cross-road, Leytonstone, N.E.—Resident Assistant Medical Officer. Salary £300 per annum, with usual residential allowances.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of vacancies for Certifying Surgeons under the Factory and Workshop Acts at Newbridge, in the county of Kildare; at Aghadowey, in the county of Londonderry; at Clackmannan, in the county of Clackmannan; and at Sedburgh, in the county of Yorks, West Riding.

Births, Marriages, and Deaths.

BIRTHS.

ANDREWS.—On Feb. 2nd, at Corran, Lochgilphead, Argyll, the wife of Dr. Alford Andrews, of a son.

BARNES.—On Feb. 3rd, at Gloucester-place, Portman-square, W., the wife of Herbert Cooper Barnes, M.D. Durh., of a daughter.

EWART.—On Feb. 4th, at The Manor House, Marylebone-road, the wife of Captain G. A. Ewart, R.A.M.C. (T.), of a son.

MARRIAGES.

IRVINE-FORTESCUE—BODDINGTON.—On Feb. 5th, at St. James's, Piccadilly, London, Captain Archer Irvine-Fortescue, R.A.M.C., to Ruth Olive, elder daughter of Henry Boddington, J.P., and of Mrs. Boddington, of Pownall, Wilmslow, Cheshire.

McGILLYCUDDY—LUKEY.—On Feb. 3rd, at St. Cuthbert's, Wells, Lieutenant Richard Hugh McGillycuddy, R.A.M.C., to Ethel Florence, second daughter of the late Edward Lukey, J.P., of Dover, and Mrs. Lukey.

PRINGLE—HART.—On Jan. 24th, at St. Matthew's, Ipswich, Arthur Young Pringle, M.R.C.S., L.R.C.P. Lond., of Glaslyn, Crescent-road, Ipswich, to Jessie Eva Hart, M.B., B.S. Lond.

DEATHS.

KIRKWOOD.—On Jan. 30th, at 1, North-street, Peterborough, George Kirkwood, M.D., L.R.C.P. & S. Edin., ex-President of the Cambridge and Huntingdon Branch, B.M.A.; Senior Surgeon of the Peterborough Infirmary.

MILLER.—On Feb. 4th, at Alum Chine Towers, Bournemouth, Frederic Richard Miller, R.A.M.C. (T.), of the 60th Division, 3rd Army, aged 50 years.

N.B.—A fee of 5s. is charged for the Insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

SOME USEFUL REFERENCE BOOKS.

LIKE other annual works of reference, Messrs. A. and C. Black's books—"Who's Who" (15s. net), "Who's Who Year Book" (1s. net), "Englishwoman's Year Book and Directory" (2s. 6d. net), and "The Writers' and Artists' Year Book" (1s. net)—have been delayed in their publication owing to the war. "Who's Who" reports occurrences up to August 31st, 1915. Some 76 additional pages have been added to an already bulky volume, making a total of 2452 pages. Its great value as a work of reference is enhanced by the appendix "Who's Who Year Book," which gives classified lists of officers, appointments, or positions held by those who are mentioned in the larger volume, and incidentally includes much useful miscellaneous information, such as the principal railway lines, names of clubs, lists of societies, schools, Nobel prize-winners, and so forth. "The Englishwoman's Year Book" is a thoroughly practical guide to the activities of women in educational, professional, social, philanthropic, and other spheres of work. The section of the book usually devoted to sports and games now gives place to a War Supplement showing what women are doing for the relief of suffering and for the more speedy end of the war. "The Writers' and Artists' Year Book," which has been compiled with the object of assisting those who write for the press, indicates the kind of articles required by the various publications, and the remuneration likely to be paid. For all who can use the pen or the brush the book is indeed a useful one.

TUNGSTEN TARGETS FOR X RAY TUBES.

THE high cost of platinum and iridium has made it impracticable to employ these metals for making the anodes of X ray tubes. The British Thomson-Houston Company, Limited, of Mazda House, 77, Upper Thames-street, London, have found that a tungsten target gives equally satisfactory results if special attention is given to its preparation. As is well known, tungsten has a high atomic weight and melting point, the latter property enabling it to resist the intense heat of the cathode ray bombardment. At the same time, the relatively low cost of this metal permits the employment of a much more substantial block of metal than when platinum or iridium is used. We understand that the practicability of building tungsten targets suitable for X ray work depends essentially on the preliminary production of ductile tungsten, and this is a problem which has been solved in connexion with the manufacture of the filament electric lamp.

RAT DESTRUCTION IN THE MALAY STATES.

IN the fourteenth annual report of the Institute for Medical Research at Kuala Lumpur (Federated Malay States) is contained an interesting discussion of the methods of dealing with the recent plague of rats. The impression still prevails among planters and others that extermination can be carried out by one or other of the viruses on the market. The Danysz virus had been tried and found wanting in South Africa and India. The Liverpool virus had been shown to be ineffective by Rosenau when the rats had access to other supplies of food. Even plague itself, which was very fatal to rats, has not produced any perceptible diminution of their number in India. Effort, to be effective, should be directed towards trapping and not poisoning them. The report contains a record of painstaking work associated with the names of Dr. H. Fraser (director), Dr. A. T. Stanton (bacteriologist), and Mr. W. Teacher (pathologist).

THE AFTER-HISTORY OF A CÆSAREAN SECTION.

ON Feb. 9th, 1893, the late Dr. C. J. Cullingworth performed Cæsarean section on a woman aged 31 suffering from a rickety pelvis with an estimated conjugate diameter of 2¾ in. The case was described in THE LANCET of Feb. 18th, 1893. The patient was pregnant for the seventh time. Three of the previous pregnancies had terminated in miscarriage and one in labour at term, when craniotomy proved necessary. On two occasions labour had been induced at seven months; the first time the child lived for a few years, the second time the patient was in the hospital at York-road, where delivery was effected by version, followed by perforation of the after-coming head. On again becoming pregnant the patient was advised to go to full time and be delivered by Cæsarean section. This was done. The operation was uneventful and the child, a well-formed male, 7¾ lb. in weight, cried vigorously as soon as it was born. We have received a letter from this child, who is now 23 years of

age, enclosing his photograph as a private in a cycling battalion. The photograph shows a robust and powerful-looking young fellow, who has therefore justified the anxious thought and care which Dr. Cullingworth gave to his pre-natal welfare.

A BRITISH MEDICAL OFFICER IN THE RUSSIAN ARMY.

THE *Aberdeen University Review* conjectures that Dr. Colin Finlayson Simpson is the only Briton who is an officer in the Russian Army. A member of the staff of the Moukden Medical College, Manchuria, China, he was anxious, when the war broke out, to serve his native country, but was unable to get through Russia and so attached himself to the Russian Red Cross Society. At the evacuation of Lodz, his superintendence of the safe removal of almost 18,000 wounded soldiers and others from there to Warsaw was warmly commended. He has since been engaged with the 9th Army in Galicia, and holds the rank in the Russian Army which corresponds to lieutenant-colonel in the British Royal Army Medical Corps.

A DILATORY PROPOSAL.

AT the Tavistock county court recently a surgeon of Whitchurch, Devon, sued a patient and his wife for medical attendance. The account was first rendered four years ago. The defence was that the diagnosis of the illness was incorrect. The judge held otherwise, and gave a verdict for the plaintiff. The defendant, who stated that his income was £200 per annum, offered to pay "one shilling monthly," in discharge of a bill of £6 16s., which had been rendered four years ago, and it is not surprising that the judge ordered the amount to be paid in two monthly instalments.

M.B.—The subject was referred to in the following numbers of THE LANCET:—Open-air Construction for War Hospitals, Dec. 25th, 1915, p. 1405; Military Emergency Hospital Construction, Nov. 20th, 1915, p. 1164; Open-air Hospitals in War-time, by Professor R. Saundby, Sept. 19th, 1914, p. 759.

A. M. P., J. E. C., R. T.—"The Goat as a Source of Milk." Our correspondents should apply direct to the Board of Agriculture and Fisheries, Whitehall, London, S.W.

J. S. T.—The matter is entirely one for private arrangement. There can be no general rule, any more than there can be a general rule for the prices to be paid.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY, Burlington House, London, W.

THURSDAY.—Papers:—Prof. A. R. Cushny and Mr. S. Yagi: On the Action of Cobra Venom.—Mr. L. Doncaster: Gametogenesis and Sex-determination in the Gall-fly, Neuroterus Lenticularis. Part III.—Philippa C. Esdaile: On the Structure and Development of the Skull and Laryngeal Cartilages of Perameles, with Notes on the Cranial Nerves (communicated by Prof. J. P. Hill).—Mr. J. C. Bose and Mr. S. C. Das: Physiological Investigations with Petiole-Pulvinus Preparation of Mimosa-Pudica (communicated by Prof. S. H. Vines).

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Tuesday, Feb. 15th.

GENERAL MEETING OF FELLOWS: at 5 P.M.
Ballot for the Election of Candidates for the Fellowship.
(Names have already been circulated.)

MEETINGS OF SECTIONS.

Tuesday, Feb. 15th.

MEDICINE and THERAPEUTICS AND PHARMACOLOGY (Joint Meeting): at 5 P.M.
Dr. Hale White (President of the Section of Therapeutics and Pharmacology) in the chair.
A Special Discussion on "Trench Nephritis" will be opened by Dr. Langdon Brown. Sir William Osler, Sir Wilmot Herringham, Mr. Mackenzie Wallis, Dr. Galloway, Dr. R. G. Abercrombie, and Dr. W. Mair will speak.
N.B.—Members of other Sections interested in the subject are specially invited to be present.

Wednesday, Feb. 16th.

HISTORY OF MEDICINE (Hon. Secretaries—Leonard G. Guthrie, J. D. Rolleston): at 5 P.M.
Books, MSS., &c., on view at 4.30 P.M.
Papers:
Mr. C. E. Wallis: Marat.
Mr. Percy Dunn: An Oculist of XVI. Century (Andreas Laurentius).
Dr. Dan McKenzie: Folk Cures by Constriction and Rings, with a digression into the Nature of the Soul.
Dr. C. G. Cumston (Geneva): Portrait of Paracelsus.

Thursday, Feb. 17th.

DERMATOLOGY (Hon. Secretaries—A. M. H. Gray, J. E. R. McDonagh): at 5 P.M.
Exhibition of Cases (at 4.30 P.M.).

Friday, Feb. 18th.

OTOLOGY (Hon. Secretaries—W. M. Mollison, E. D. D. Davis): at 5 P.M.
Cases and Specimens:
Will be shown by Mr. Sydney Scott, Dr. Dan McKenzie, Mr. Mollison, and others.
Short Communication:
Dr. Dan McKenzie: Otogenic Facial Paralysis.

ELECTRO-THERAPEUTICS (Hon. Secretaries—S. Gilbert Scott, E. P. Cumberbatch): at 8.30 P.M.
CLINICAL MEETING.
Cases will be shown, also skiagrams and new apparatus.

LONDON DERMATOLOGICAL SOCIETY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY.—4.30 P.M., Cases sent for Consultation. Demonstration of Pathological Specimens. Clinical Cases will be shown by Dr. J. L. Bunch, Dr. M. Dockrell, Captain W. Griffith, Dr. W. K. Sibley, Dr. C. Kempster, and Captain C. H. Mills. 5.30 P.M., Paper:—Dr. W. K. Sibley: The Treatment of Scars.

ROYAL MICROSCOPICAL SOCIETY, 20, Hanover-square, W.

WEDNESDAY.—8 P.M., Mr. Heron-Allen, Mr. A. Earland, and Mr. C. F. Rousselet: On the Progress and Development of Vision and Definition under the Microscope. Demonstration:—Mr. J. E. Barnard: An Experiment with the Ultra-microscope.

MEDICO-PSYCHOLOGICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND, 11, Chandos-street, Cavendish-square, W.

THURSDAY.—11.15 A.M., Educational Committee. 12 noon, Parliamentary Committee. 12.30 P.M., Library Committee. 1.45 P.M., Council Meeting. 2.45 P.M., General Meeting. Paper:—Dr. G. M. Robertson: The Employment of Female Nurses in the Male Wards of Mental Hospitals.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.

Course of Lectures on the Anatomy of the Human Body, for First-aid and Ambulance Students (open to all members of ambulance companies and first-aid classes):—
MONDAY, WEDNESDAY, AND FRIDAY.—5.30 P.M., Prof. A. Keith. 4 P.M. to 7 P.M., Exhibition of Anatomical Preparations and Specimens in the Theatre on lecture days, and between 10 A.M. and 5 P.M. in the Hall of the Museum on the following day.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.
TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Addison: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations. Dr. Simson: Diseases of Women.
THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.
FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Addison: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.
SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays Mr. Pardoe: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY.—Clinics:—10.30 A.M., Surgical Out-patients (Mr. E. Gillespie). 2.30 P.M., Medical Out-patients (Dr. T. R. Whipham): Gynæcological Out-patients (Dr. Banister). 3 P.M., Medical In-patients (Dr. R. M. Leslie).
TUESDAY.—2.30 P.M., Surgical Operations (Mr. Carson). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. Howell Evans); Nose, Throat, and Ear Out-patients (Mr. C. H. Hayton). Radiography (Dr. Metcalfe). 3.30 P.M., Medical In-patients (Dr. A. J. Whiting).
WEDNESDAY.—Clinics:—2.30 P.M., Throat Operations (Mr. C. H. Hayton). Children Out-patients (Dr. T. R. Whipham); Eye Out-patients (Mr. R. P. Brooks); Skin Out-patients (Dr. H. W. Barber). 5.30 P.M., Eye Operations (Mr. R. P. Brooks).
THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles). Clinics:—Medical Out-patients (Dr. A. J. Whiting); Surgical Out-patients (Mr. Carson); Radiography (Dr. Metcalfe). 3 P.M., Medical In-patients (Dr. R. M. Leslie).
FRIDAY.—2.30 P.M., Surgical Operations (Mr. Howell Evans). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. E. Gillespie); Eye Out-patients (Mr. R. P. Brooks).

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, 49, Leicester-square, W.C.

TUESDAY.—6 P.M., Dr. W. Griffith: The Treatment of Diseases of the Skin.

THE THROAT HOSPITAL, Golden-square, W.

MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.
THURSDAY.—5.15 P.M., Clinical Lecture.

ROYAL INSTITUTION OF GREAT BRITAIN, Albemarle-street, Piccadilly, W.

TUESDAY.—3 P.M., Prof. C. S. Sherrington: Nerve Tone and Posture. (Lecture V.)

For further particulars of the above Lectures, &c., see Advertisement Pages.

The following magazines, journals, &c., have been received:—Bulletin of the Johns Hopkins Hospital, West London Medical Journal, American Journal of Obstetrics, Pediatrics, American Journal of Orthopedic Surgery, Practitioner, Military Surgeon, Archives of Internal Medicine, Parasitology, Revista de Medicina y Chirugia de la Habana, Brain, British Journal of Surgery, Revue d'Hygiène et de Police Sanitaire, Midland Medical Journal, Calcutta Medical Journal, Indian Medical Record, Indian Medical Gazette, Quarterly Journal of Medicine, Transactions of the Society of Tropical Medicine and Hygiene, Journal of State Medicine, Clinique Ophtalmologique, British Dental Journal, Edinburgh Medical Journal, Annali di Medicina Navale e Coloniale, Public Health, St. Bartholomew's Hospital Journal, St. Thomas's Hospital Gazette, Ophthalmology, Archives of the Middlesex Hospital, Man, North American Review, Biochemical Journal, Journal of Laryngology, Rhinology, and Otology, American Journal of Medical Sciences, Journal of Tropical Medicine and Hygiene.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, AND WHEN ACCOMPANIED BY BLOCKS IT IS REQUESTED THAT THE NAME OF THE AUTHOR, AND IF POSSIBLE OF THE ARTICLE, SHOULD BE WRITTEN ON THE BLOCKS TO FACILITATE IDENTIFICATION.

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET *should be addressed "To the Manager."*

We cannot undertake to return MSS. not used

MANAGER'S NOTICES.

THE INDEX TO THE LANCET.

THE Index and Title-page to Vol. II. of 1915 were given in THE LANCET of Dec. 25th, 1915.

VOLUMES AND CASES.

VOLUMES for the second half of the year 1915 are now ready. Bound in cloth, gilt lettered, price 16*s.*, carriage extra.

Cases for binding the half-year's numbers are now ready. Cloth, gilt lettered, price 2*s.*, by post 2*s.* 4*d.*

To be obtained on application to the Manager, accompanied by remittance.

TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, London, W.C., are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

Subscribers, by sending their subscriptions direct to THE LANCET Offices, will ensure regularity in the despatch of their Journals and an earlier delivery than the majority of Agents are able to effect.

THE COLONIAL AND FOREIGN EDITION (printed on thin paper) is published in time to catch the weekly Friday mails to all parts of the world.

ALTERATION OF INLAND SUBSCRIPTION RATES.

OWING to the alteration in the Inland Newspaper Postal rate, the postage on each copy of THE LANCET will in future be 1*d.*, and sometimes 1½*d.*

The revised Inland Subscription rates are:—

One Year	£1	3	3
Six Months	0	13	8
Three Months	0	7	0

The rates for the Colonies and Abroad (thin paper edition) will be as usual:—

One Year	£1	5	0
Six Months	0	14	0
Three Months	0	7	0

Subscriptions (which may commence at any time) are payable in advance. Cheques and Post Office Orders (crossed "London County and Westminster Bank, Covent Garden Branch") should be made payable to the Manager, Mr. CHARLES GOOD, THE LANCET Offices, 423, Strand, London, W.C.

TO COLONIAL AND FOREIGN SUBSCRIBERS.

SUBSCRIBERS ABROAD ARE PARTICULARLY REQUESTED TO NOTE THE RATES OF SUBSCRIPTIONS GIVEN ABOVE.

The Manager will be pleased to forward copies direct from the Offices to places abroad at the above rates, whatever be the weight of any of the copies so supplied.

NEWSPAPERS FOR NEUTRAL COUNTRIES.

THE Secretary of the War Office has issued the following order:—

The public are informed that on and after Saturday, November 6th, newspapers, magazines, books, and other printed publications (other than trade circulars) will not be sent forward to neutral European countries unless posted direct from the office of publishers or newsagents who have obtained permission from the War Office for this purpose. Persons desiring to send newspapers, &c., to neutral European countries should, therefore, give their orders for execution to publishers or newsagents who have obtained such permission.

The Publisher of THE LANCET has obtained the required permission of the War Office, and he will forward copies direct from the Office to any neutral country on receipt of instructions.

ADVERTISEMENT RATES.

Books and Publications ... ...
Official and General Announcements
Trade and Miscellaneous Advertisements and Situations Vacant ...
} Five lines and under ... 4*s.* 0*d.*

Every additional line, 6*d.*

Situations Wanted: First 30 words, 2*s.* 6*d.*
Per additional 8 words, 6*d.*

Quarter Page, £1 10*s.* Half a Page, £2 15*s.*
Entire Page, £5 5*s.*

Special terms for Position Pages.

Advertisements (to ensure insertion the same week) should be delivered at the Office not later than Wednesday, accompanied by a remittance.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, Feb. 9th, 1916.

Date.		Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks
Feb.	3	29·680	S.W.	...	57	51	41	46	47	Raining
,,	4	28·990	S.W.	0·32	81	51	47	45	47	Raining
,,	5	29·580	W.	0·10	77	50	42	41	42	Cloudy
,,	6	29·900	S.W.	.	55	52	42	43	44	Overcast
,,	7	29·884	W.	0·09	77	47	42	42	45	Cloudy
,,	8	29·814	S.W.	...	69	46	37	36	37	Fine
,,	9	29·514	S.W.	...	60	43	32	31	32	Fine

Communications, Letters, &c., have been received from—

A.—American Medical Publishing Co., New York, Managing Editor of; Mr. F. Aldridge, Lond.; Ardath Tobacco Co., Lond.; Mr. F. W. Alexander, Lond.; Dr. Alfred Ashby, Reading; Messrs. Adlard and Son, Lond.; Messrs. Claudius Ash, Sons, and Co., Lond.; Dr. R. Armstrong-ones, Woodford Bridge.

B.—Fleet-Surgeon P. H. Boyden, R.N., Chatham; Dr. G. S. Brock, Rome; *British Medical Journal*, Lond., Manager of; British Thomson-Houston Co., Lond.; Mr. Wm. Bryce, Edinburgh; Messrs. Burroughs Wellcome and Co., Lond.; Messrs. Burgoyne, Burbidges, and Co., Lond.; Dr. George S. Banks, Aberdeen; Dr. F. E. Batten, Lond.; Mr. J. E. Burton, Plymouth; Mr. Henry Bazett, Lond.; Sir Lauder Brunton, Bart., Lond.; Professor W. Blair Bell, Liverpool; Messrs. Butterworth and Co., Lond.; Borough Hospital, Birkenhead, Matron of; Messrs. W. H. Bailey and Son, Lond.; Bury Infirmary, Secretary of; Mrs. K. Behnke, Lond.

C.—Miss H. Cashmore, Bristol; Mr. S. Forrest Cowell, Lond.; Miss E. Chessall, Lond.; Mr. H. Cooper, Lond.; Chambers Advertising Agency, New Orleans; Cavendish Nursing Association, Lond.; Collier Tyre Co., Lond.; County Asylum, Newport, Clerk to the; *Canadian Medical Association Journal*, Montreal, Editor of; Coventry and Warwickshire Hospital, Secretary of; Messrs. E. Cook and Co., Lond.; Dr. Zachary Cope, Lond.

D.—Mrs. Dickinson, Brighton; Sir H. Bryan Donkin, Lond.; Mr. G. de H. Dawson, Lond.; Mr. J. F. Devane, Limerick; *Dundee Courier*, Proprietor of; Messrs. W. Dawson and Sons, Lond.; Messrs. Down Bros., Lond.; Captain Donald Duff, R.A.M.C., Malta; Mr. H. Dickinson, Lond.

E.—Messrs. Eyre and Spottiswoode, Lond.; *The Engineer*, Lond., Managing Director of; E. C. S. S.; Eccleston Hall Sanatorium, St. Helens, Resident Physician of; Mr. F. W. Edridge-Green, Lond.; Dr. John Eyre, Lond.

F.—Messrs. F. H. Faulding and Co., Lond.; Factories, Chief Inspector of, Lond.; Dr. R. Fortescue Fox, Lond.; Dr. Martin Ficker, Lond.

G.—Captain P. Withers Green, R.A.M.C., France; Dr. A. Stanley Griffith, Cambridge; Mrs. Glen, Grangetown.

H.—Dr. F. Hernaman-Johnson, Lond.; Hunterian Society, Lond., Hon. Secretaries of; Mr. C. Colgate Holman, Northampton; Highlands and Islands (Medical Service) Board, Edinburgh, Secretary of; Fleet-Surgeon W. E. Home, R.N., Vancouver Island; Dr. D. Berry Hart, Edinburgh; Huddersfield Royal Infirmary, Secretary of.

I.—Isle of Wight County Asylum, Newport, Clerk to the; Illuminating Engineering Society, Lond., Hon. Secretary to.

J.—Mr. D. F. Johnson, Newport, Isle of Wight; J. S. T.

K.—Messrs. H. S. King and Co., Lond.; Miss A. H. P. Kirby, Lond.

L.—Dr. A. Lewthwaite, Bocking; Dr. T. Laffan, Cashel; Dr. Lane, Hereford; Lloyd's Bank, Gosport, Manager of; Messrs. Lee and Nightingale, Liverpool; Messrs. H. K. Lewis and Co., Lond.; Leeds Public Dispensary, Secretary of; Major Hugh Lett, R.A.M.C., B.M.H.F.; London Temperance Nurses' Co-operation, Lond., Secretary of; Messrs. Lee and Martin, Birmingham; Leicester Corporation, Medical Officer of Health of; London Missionary Society, Editorial Secretary of; Dr. F. Langmead, Lond.

M.—Dr. R. A. Macneill, Lond.; Messrs. C. Mitchell and Co., Lond.; Mr. J. Mackay, Glasgow; *Manchester Courier*, Lond., Editor of; Dr. James McIntosh, Lond.; Mr. R. Maclean, Morpeth; Dr. W. G. McDowell, Lond.; Dr. Alastair MacGregor, Lond.; Medico-Psychological Association of Great Britain and Ireland, Acting Hon. General Secretary of; Dr. F. W. Mott, Lond.; Dr. Charles Mercier, Parkstone; Medical Defence Union, Lond., General Secretary of; *Midland Counties Herald*, Birmingham; Messrs. Mertens and Co., Lond.; Maltine Manufacturing Co., Lond.; Manchester Corporation, Town Clerk of; Manchester Northern Hospital, Secretary of; Mr. J. F. Mackenzie, Edinburgh; Mrs. MacIlwaine, Belfast.

N.—National Housing and Town Planning Council, Lond.; Dr. Victor Nicolopulo, Gargaliano; Mr. John Nicholson, Lond.; National Council of Trained Nurses of Great Britain and Ireland, Lond., Hon. Secretary of.

P.—Rev. W. H. Parkes, Aldridge; Mr. Philip S. Platt, New York; Mr. F. Penny, Barnsley; Mr. A. M. Page, Lond.; Miss Pryce, Bournemouth; Sir Robert Philip, Edinburgh; Dr. E. E. Prest, New Cumnock.

R.—Dr. Amand Routh, Lond.; Captain P. M. Rennie, I.M.S., Lond.; Mr. Archie L. Richards, Boulogne; Messrs. Richardson and Co., Lond.; Mr. E. K. Robinson, Hampton Wick; Royal Society, Lond.; Royal Institution of Great Britain, Lond., Secretary of; Mr. L. B. Rawling, Lond.; Royal Society of Medicine, Lond., Secretary of; Dr. J. C. S. Rashleigh, Lond.; Messrs. Reynell and Son, Lond.; Royal College of Surgeons of England, Secretary of; Mr. E. Robbins, Lond.; Royal Meteorological Society, Lond.; Royal Medical Benevolent Fund, Lond., Hon. Secretary of; Royal Microscopical Society, Lond., Secretary of; Royal Academy of Medicine in Ireland, Dublin; Royal Society of Arts, Lond.; Dr. George M. Robertson, Edinburgh; Dr. Edward C. Register, Charlotte.

S.—Miss G. Stonham, Lond.; Dr. Harrington Sainsbury, Lond.; Messrs. G. Street and Co., Lond.; Mr. P. Schneider, Barcelona; Captain J. M. Smith, A.V.C., Mediterranean Force; Dr. G. M. Sydenham, Chelwood Gate; Dr. W. G. Spencer, Lond.; Special Hospital for Officers, Lond., Matron of; Professor A. E. Shipley, Cambridge; Miss Marion Silverston, Edgbaston; Dr. Julio Samper, Indianapolis; Messrs. Stechert and Co., Lond.; Messrs. W. H. Smith and Son, Lond.; Messrs. Saward, Baker, and Co., Lond.; Messrs. A. Straker and Sons, Lond.; Salford Royal Hospital, Secretary of; Surgery Publishing Co., New York, President of.

T.—Dr. C. E. Thornton, Lond.; Dr. John Tatham, Old Oxtead; Dr. C. H. Tattersall, Salford; Mr. M. Taylor, Shenstone; Mr. E. C. Taylor, Lond.; Dr. J. L. Todd.

V.—Lieutenant J. A. Venning, R.A.M.C., France; Veterinary Director-General, Ottawa; Miss Vigor, Lond.

W.—Messrs. Willows, Francis, Butler, and Thompson, Lond., Mr. E. H. Worth, Lond.; Captain A. G. Watkins, R.A.M.C., France; Mr. David Williams, Blaenclydach; Messrs. A. B. and F. Willis, Lond.; Dr. R. Prosser White, Wigan; West London Hospital Post-Graduate College, Dean of; Dr. Charles Watson, Edinburgh; Mr. Edward West, Birmingham; West Ham and Eastern General Hospital, Secretary of; Mr. E. S. Weymouth, Lond.

Letters, each with enclosure, are also acknowledged from—

A.—Messrs. Allen and Hanburys, Lond.; Dr. C. Adam, Elgin; Dr. E. L. Ash, Lond.; A. I., Broadstairs; Dr. T. D. Acland, Lond.

B.—Dr. W. L. Brown, Lond.; Mr. W. A. Bowring, Brighton; Dr. G. Bowman, Manchester; Messrs. Bresillon and Co., Lond.; Fleet-Surgeon W. J. Bearlock, R.N., Lond.; Birmingham Corporation, Treasurer to the; Bristol Royal Infirmary, Secretary of; Dr. G. T. Beatton, Caversham; Mr. L. J. Bartlett, Warmington; Bermondsey Corporation, Lond., Accountant to the; Miss M. Beadon, Malvern; Lieutenant-Colonel Bolam, R.A.M.C., Newcastle-on-Tyne; Dr. H. Browne, Hoylake; Blackburn Corporation, Accountant to the; Bury Corporation, Accountant to the; Bolton Infirmary, Secretary of; Dr. M. Boileau, Wymondham; Bristol University, Registrar of; Dr. T. P. Berry, Swindon; Dr. A. Baldock, Lond.; Mr. L. M. Bowen-Jones, Carmarthen; Dr. J. S. Boothroyd, J.P., Driffield; Dr. H. Beckett-Overy, Lond.

C.—Mr. A. R. Colyer, Lond.; County Hospital, Motherwell; Mr. W. H. Coltart, Exmouth; Messrs. Cass and Co., Ely; C. F. P.; C. S. S.; C. M. W.

D.—Mr. T. Dow, Newbiggin-by-Sea; Dalrymple House, Rickmansworth, Medical Superintendent of; Derby Corporation, Accountant to the; Mrs. Diamond, St. Leonards-on-Sea; Dr. J. T. R. Davison, Buenos Aires; Durham County Asylum, Clerk to the.

E.—Endsleigh Palace Hospital for Officers, Lond., Secretary of; Messrs. W. and T. Evans, Cork; E. B.; East Ham Education Committee, Treasurer to the; Messrs. Elliott, Son, and Boyton, Lond.

F.—Dr. P. G. Foulkes, Aveley; Dr. H. Finley, Malvern.

G.—Dr. A. Greenwood, Maidstone; Messrs. C. Griffin and Co., Lond.; Glasgow Corporation, Clerk to the; G. F. W.; Dr. Gordon, Darlington; Dr. S. Gill, Formby; Mr. K. W. Goadby, Lond.; Dr. M. Greenwood, Lond.; Messrs. Gordon and Gotch, Lond.; Glasgow University, Factors of; Dr. A. F. Galloway, Lond.; Mr. A. F. Gervis, Lond.

H.—Dr. R. A. Hayes, Dublin; Dr. G. D. Henderson, Holyoke, U.S.A.; Dr. P. Howe, Denton; Colonel M. P. Holt, A.M.S., France; Mr. E. Hotson, Lond.; Mr. R. Halton, Hednesford; Dr. C. A. P. Harrison, Berehaven; Lieutenant W. S. Hall, R.A.M.C., Bedford; Messrs. Abel Heywood and Son, Manchester.

J.—Mr. W. Jones, Liverpool; J. E.; Dr. D. O. Jones, Newport, Mon.; J. H. W.; Dr. R. Jardine, Glasgow.

K.—Mr. J. I. F. Knight, Theale; Dr. H. C. Kidd, Bromsgrove; Mr. C. Kundig, Geneva.

L.—Mr. T. S. Logan, Stone; Captain J. S. Levis, R.A.M.C., France; L. G. W.; Liverpool Corporation, Treasurer to the; Leeds General Dispensary, Secretary of.

M.—Mr. C. Myers, Birmingham; Dr. D. Mackinnon, Island of Tiree; Dr. J. Holmes Morrison, Dover; Dr. J. McDonald, Belford; Dr. L. J. Minter, Brighton; Montreal General Hospital, Secretary of; Medical Sickness and Accident Society, Lond., Secretary of; Dr. H. H. MacWilliam, Liverpool; Mr. B. J. Mayne, Carn Brea; Dr. W. McLachlan, Sutton; Dr. J. MacLaughlin, Bangor, Ireland; Captain B. C. Maybury, R.A.M.C., France; Mr. J. More, Rothwell.

O.—Mr. C. A. P. Osburne, Old Catton.

P.—Pembrokeshire County Council, Haverfordwest, Clerk to the; Mrs. Patterson, Dublin; Miss C. Poole, Lond.; Dr. G. L. Pardington, Tunbridge Wells.

R.—Mr. H. B. Robinson, Lond.; Royal Naval Hospital, Chatham, Surgeon-General to the; Dr. E. T. Roberts, Cambualang; Dr. J. T. Rogerson, Douglas; Mr. R. A. Ross, Prestatyn.

S.—Mr. H. E. Scoones, Hythe; Mr. F. L. Simons, Edinburgh; St. Andrew's Hospital, Lond., Secretary of; St. Helen's Corporation, Accountant to the; Messrs. W. B. Saunders Co., Lond.; Dr. F. L. Smith, Louth; Dr. P. C. C. Smith, Tunbridge Wells; Mr. J. P. Sharples, Wye; Mr. H. W. Speight, Porthleven; Mr. L. Scudamore, Abertysswg; Sheffield Royal Hospital, Secretary of.

T.—Colonel R. Thompson, Chester; Tunbridge Wells Corporation, Accountant to the; Mrs. K. Taggart, Stockport; Mrs. Thwaites, Lond.; Mr. H. L. Titchener, Reigate; Dr. W. J. Turrell, Oxford; Messrs. Tippetts, Lond.; Messrs. W. S. Thacker and Co., Lond.; Miss M. C. Tod, Corstorphine; Mr. Moses Taylor, Shenstone.

V.—Victoria Central Hospital, Liscard, Secretary of.

W.—Miss Witts, Sheffield; Messrs. W. Wood and Co. New York; Wrexham Infirmary, Secretary of; Wimbledon Corporation, Accountant to the; Mr. A. Walker, Glossop; Dr. H. Wise, Poynton; Dr. T. J. Walker, Peterborough; Mr. C. F. Weeks, Liverpool.

EVERY FRIDAY.

THE LANCET.

PRICE SIXPENCE.

SUBSCRIPTION POST FREE.

FOR THE UNITED KINGDOM.		TO THE COLONIES and ABROAD.	
One Year	£1 3 3	One Year	£1 5 0
Six Months	0 13 8	Six Months	0 14 0
Three Months	0 7 0	Three Months	0 7 0

Subscriptions (which may commence at any time) are payable in advance.

ADVERTISING.

Books and Publications	Five Lines and under £0 4 0
Official and General Announcements	
Trade and Miscellaneous Advertisements and Situations Vacant ...	Every additional Line 0 0 6

Situations wanted: First 30 words, 2s. 6d.; per additional 8 words, 6d.
Quarter Page, £1 10s. Half a Page, £2 15s. An Entire Page, £5 5s.
Special terms for Position Pages.